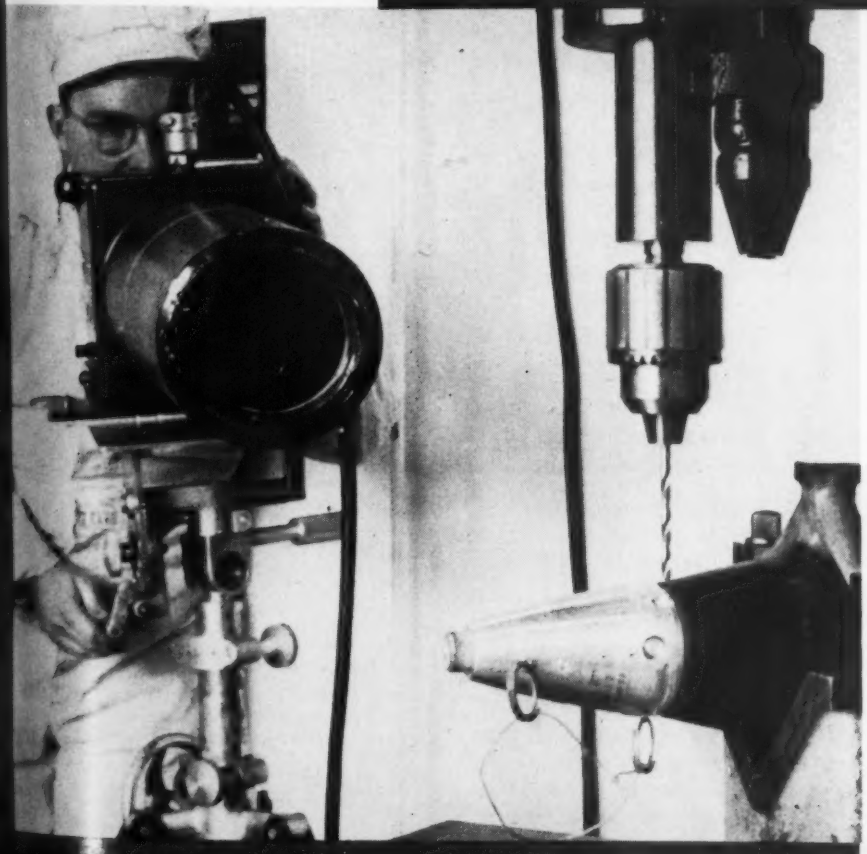
Western Industry

February
1957

Vol. XXII, No. 2

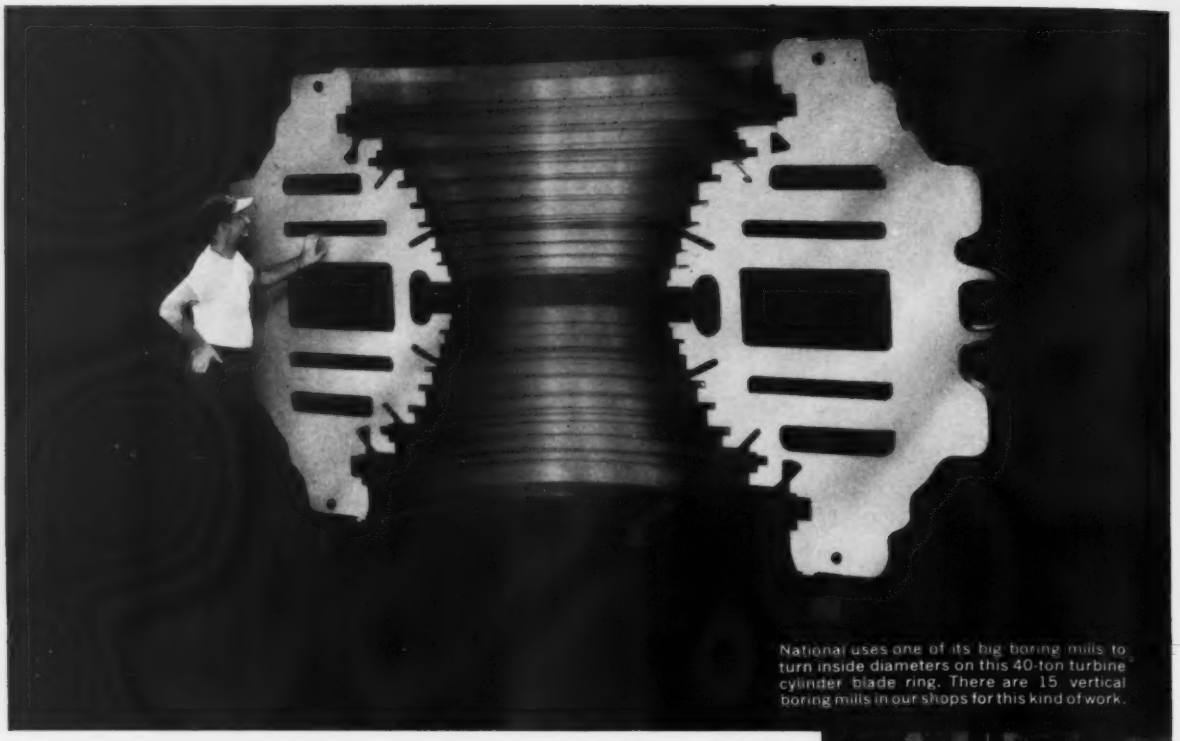
TOP-NOTCH POWER SYSTEM



PLANT TEST

TODAY'S 50 BEST MANUALS ON OVERHEAD HANDLING
yours for the asking
.... p. 66

TEN OPINIONS ON MECHANICAL WATER TREATMENT GADGETS
.... p. 12

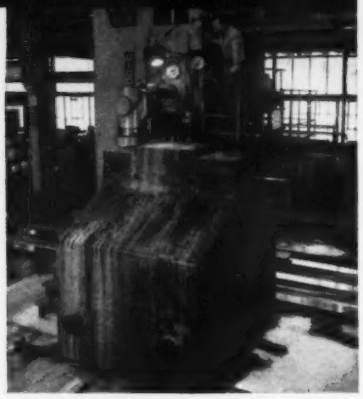


National uses one of its big boring mills to turn inside diameters on this 40-ton turbine cylinder blade ring. There are 15 vertical boring mills in our shops for this kind of work.

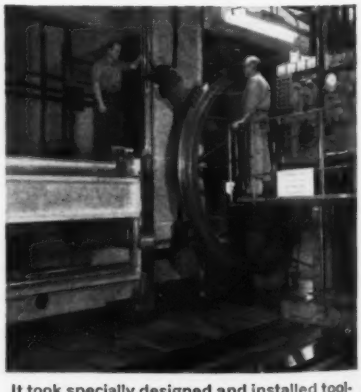
Here's why National can handle your big machining jobs—

As the largest completely integrated machinery manufacturing plant in the West, National's special facilities and operating skills are tailor-made for big, precise machining jobs. Current examples of these kinds of jobs are shown at right. They are typical of the hundreds of such assignments we have handled for many western firms at our Torrance, California, plant.

Why not let this unusual combination of experienced plant operators, engineering skill and complete facilities solve your special steel products problems? National can help you today. Call or write the address below for more information—or better still, plan to visit the plant soon.



Here, experienced operators handle a really big job—machining a 58-ton anvil for a 7500 lb. forge hammer. National's specialized equipment handles even this unusually large piece with ease.



It took specially designed and installed tooling to machine this 40-ton fabricated steel balance tank (18′ 7″ x 15′ 3″ x 10′ 8″). This is typical of National's special handling and careful engineering on such jobs.

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Have another bite, Dimbulb! You said you'd "eat" this tire if it didn't outlast a MONARCH!

Have a heart, boss! That was only a figure of speech!

G'wan . . . eat! That "figure of speech" cost us plenty! We've replaced too many solid tires lately!

But I thought all solid tires were the same!

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Then they must cost more! How do we save if we have to pay a premium?

There's no premium for MONARCH tires! They cost no more than other brands. But . . . they do give more mileage per dollar because they are made by specialists and modern equipment from the finest raw materials available. Users' records as well as fatigue tests prove they are best!

I'll buy that! And I'll call the local MONARCH dealer today for prices.

Why don't you check the Yellow Pages for your nearest Monarch dealer? Ask him, or write direct, for our new 16-page CATALOG MR-457. It's full of facts, specifications and suggestions to help you save more on solid tires.

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- 1035 Bartlett Street, Hayward, Calif.

7314-MR

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KING PUBLICATION

FEBRUARY, 1957

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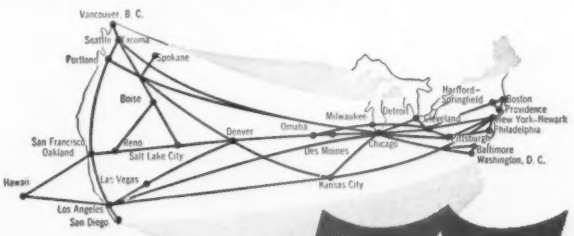

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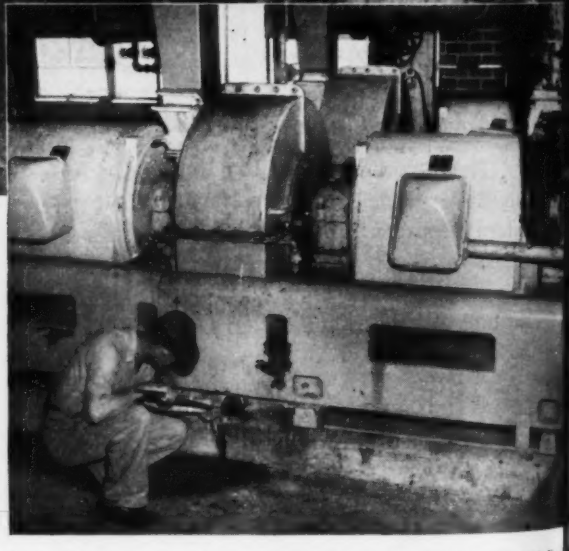
One in a series
on the application
of electric motors
in modern industry

This washer removes fly ash from cars left in the parking lot. The 25 hp. Reliance A-c. Motor automatically starts and stops 200 to 400 times a day in all kinds of weather.



These two Bauer Refiners are driven by Reliance 400 hp. A-c. Motors. The grinding action of the machines sets up heavy load factors on the motors.

RELIANCE motor design proved in new paper mill

Here is a 100 hp. Reliance Totally-Protected A-c. Motor doing a job under very adverse conditions. The water and pulp being sprayed on it is coming from a paper board machine, part of an installation that Crossett Paper Company recently built to produce bleached kraft board from hardwood and pine pulp.

But there is more to a Reliance Motor than just a good enclosure. Extra copper and iron, the best bearing lubrication system, tough, resistant insulation . . . these and many more features add up to designed durability, the one big feature that makes users, like Crossett, steady Reliance customers.

Call your Reliance representative and ask him to show you the Reliance extras. Fifteen minutes of your time now can save hours of machine down-time later.

For further details on this installation, write for bulletin B-2504. B-1635

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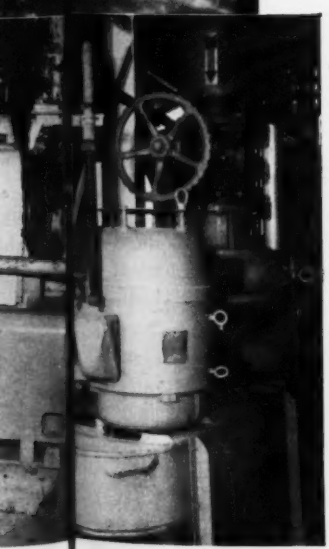
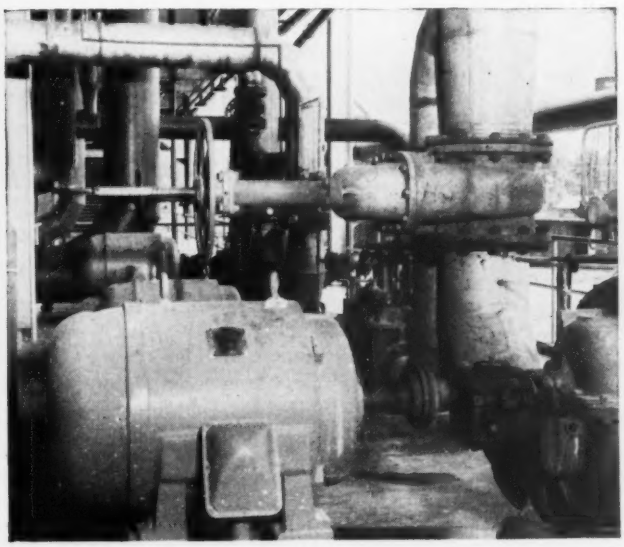
◀ Located under the head end of the board machine, this 100 hp. Reliance A-c. Motor operates a fan pump while periodically being drenched with water and pulp.



ce 400 hp
es sets up

Reliance has frame designs for every application. Here is a 25 hp. foot mounted vertical motor driving a refined-stock pump. Other vertical designs include C-Face, D-Flange, and P-Base mountings.



This 60 hp., 1800 rpm and two 40 hp. 900 rpm Reliance A-c. Motors run white water pumps. Though reasonably sheltered from the elements, the motors are subjected to wide temperature changes.

In hard to reach spots like this two story high refined stock chest, Metermatic Bearing lubrication is very important. This new line 20 hp. Reliance A-c. Motor will operate the agitator for months without greasing.

. . . for more details, circle No. 4 on Reader Service Postcard

Western Industry February 1957

VIEWS & COMMENT

NEVER HAVE WE SEEN SO EQUAL A DIVISION OF OPINION, with protagonists and antagonists so inflexibly opinionated, as on the subject of the efficacy of mechanical water conditioning devices. We touched off a barrage of telephone calls and "letters to the editor" by presenting an article in the November 1956 issue in which, you will recall, the author expressed his grave doubts that the gadgets lived up to makers' claims.

Although we enjoyed hearing all of the pro-and-con comments, they helped us arrive at no conclusions. And we are certain that the selected comments presented in this issue ("Letters," p. 12) will not help you, Mr. Western Plant Superintendent and Engineer, determine a conclusive opinion either.

This is unfortunate, because *if the gadgets accomplish water conditioning, scale elimination and corrosion control* as simply and economically as many claim, hundreds of thousands of dollars can be saved right now in plant operating costs. Conversely, *if claims for the gadgets are fraudulent,* in turn even more thousands of dollars are bound to be lost in damage to plant facilities through even temporary dependence upon their workability.

The entire controversy could be stopped in only one way—*by subjecting the gadgets to extensive laboratory experiments,* pilot run or full scale, simulating many different types of actual operating conditions, with the experiments conducted by an entirely impartial research organization (Stanford Research Institute, for example, or the appropriate engineering department of a Western university). The research project should be adequately financed so that a thorough investigation becomes possible.

Many "studies" of the gadgets have been made, but none to our knowledge has been *complete* (covering many varying application conditions) or *authoritative* (carried out by a completely unbiased scientific research team). Only upon the basis of such an investigation will we—and you—ever be able to have confidence in any black or white opinion about mechanical water conditioners. Perhaps it would be found that the scientifically validated opinion could be characterized by a shade of grey!

•

TWO OF OUR BEST FRIENDS NOW HAVE "KILO-BUCK"* SALARIES, well into five figures, in newly-accepted engineering assignments at Western plants. Good news? Yes, except for one disturbing factor—*both have left positions on university teaching staffs to become private industry "Kilo-Buckers."*

Significantly, both were dedicated to all of the ideals of the teaching profession. Both would still be members of an engineering faculty were it not for the inescapable attraction to (and necessity for) a lot more money as the route to an acceptable standard of living for their families in our dollar-inflated economy.

Both men more than doubled their salaries by moving out of university classrooms; their only personal loss was the opportunity to remain a part of the profession they preferred. In a general sense, a real loss was incurred when their former universities had to "make do" with young instructor replacements still idealistic enough to accept nether-region salaries. Subsequent losses will come when young engineers enter the industrial world inadequately trained for the increasingly complex tasks created by our swiftly advancing technology.

Basically, *the fault for these losses will be ours*—all of us, for not insisting again and again that the faltering dignity of the engineering teaching profession be bolstered, and the increasing challenges being faced by its members recognized, by equating its salaries realistically with those of the engineering professions in private industry.

* *More than a thousand bucks per month.*

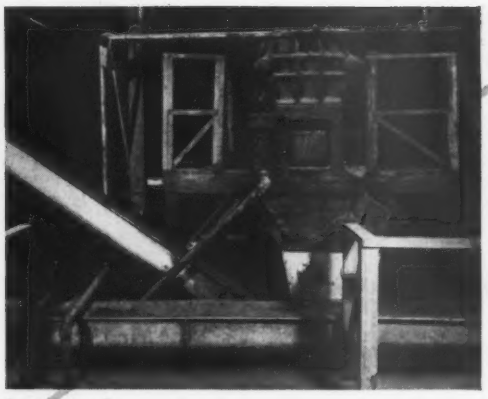
•

SUPERVISORY MANAGEMENT IS MATURING FAST. Don't believe it? Take a look at the story on page 48 of this issue, describing how an enthusiastic bunch of Western supervisory management men took over some of the prerogatives traditionally held sacred by top-level executive management. The results: an unusual display of supervisory competence in handling these responsibilities, and some new ideas on ways to strengthen your company management team.

•

WHAT'S THE SINGLE BIGGEST—AND MOST IMPORTANT—PIECE OF EQUIPMENT IN YOUR PLANT? You'll get the answer in March WI, with plenty of ideas on how your planning for this "equipment" forecasts fortune or flop!

by conveyor belts



by spiral conveyors

If you move materials

by bucket elevators

by scraper conveyors

JEFFREY offers you

equipment incorporating the know-how gained in three-quarters of a century of studying and solving material-handling problems. Today, in thousands of plants throughout the world, Jeffrey conveying equipment is depended upon to maintain high production schedules, lighten the burden of labor and reduce operating costs.

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Saves $100 per unit

Griffin Tank and Welding Service of Dallas, Texas, custom builds geographic photographic equipment. This equipment must be light-proof, weatherproof, dustproof and air tight. "When SKIL drivers were substituted for hand tools for fastening, we saved over $100.00 per unit, and quality improved tremendously," says C.B. Jones, Chief Engineer.

Saves one operator

At Mercury Engineering Company, Milwaukee, Wisconsin, two men formerly handled the job above—drilling a 1⅛" hole in 16" steel. Then a SKIL Model 163 was tried. Now, one man not only drills, he also reams, taps and hones. "We always had good experience with all models of SKIL drills," says Ted Curtis of Mercury.

Metalworkers SAVE with SKIL tools

Saves $100 per week

"Our new SKIL Shear paid for itself in the first week," says J.M. McLain, owner of J. M. McLain & Sons Trailer Company, Houston, Texas. "In using other makes of shears we found that maintenance costs were about to run us out of business. Some operations were cut from 30 minutes to 1½ minutes. My men like SKIL shears because they are adaptable and easier to handle."

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With Model 142 you can grind more types of materials than any other grinder. Engineered for the toughest work. No matter what you have to grind, fasten, saw or drill, there's a SKIL tool that can do the job faster, better or cheaper. Let your SKIL distributor show you why. Let him show you the speed, power, versatility and ease of handling of all SKIL power tools.

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LETTERS

THE EFFICACY OF WATER CONDITIONING GADGETS?

We asked for it . . . in an editor's box accompanying Robert. W. Owen's discussion, November 1956 issue. "The 'New' Water Treatment Gadgets—Do They Work?" And we got it . . . plenty of accounts of user experiences with various types of mechanical conditioners on the market today. A few of the more interesting letters are reproduced below, with no attempt on our part to favor either the "pro" or "con" in this presentation. In fairness to the manufacturers of these conditioners who have also contacted us to date, we also present their reactions to the article and the author's adverse conclusions. The final letter on the subject, as you will see, is not from a user of the conditioners but is from a man who has been intimately concerned with some special problems faced by one of the conditioner manufacturers. We remain in as much of a quandary about today's water conditioning gadgets as you probably are—which means that our columns will remain open to useful material on the subject. Additional comments are welcome. Names will be withheld if requested. Address: Editor, WESTERN INDUSTRY. *609 Mission St., San Francisco 5*—Ed.

We have proved they work, but please tell us how!

EDITOR—I read your article in the November issue titled "The 'New' Water Treatment Gadgets—Do They Work?" with great interest and profound disappointment.

The interest, because this firm has had one of these gadgets in a 25-hp. vertical tube boiler for the past eight months, and the disappointment because your article did not help me understand why it works. The device we are using is manufactured by Packard Water Conditioner, and consists of permanent magnet secured in a copper tube, mounted in a co-axial manner inside the boiler water feed pipe.

To date the results are:

1. Near complete removal of scale from crown sheet, tubes, and all sides. Some of the chunks loosened and removed were as thick as 3/8 of an inch.

2. Evidence on the removed chunks that they are literally "eaten into." Where formerly the scale presented a hard non-porous surface, it now is very porous, and seems to be "dusting" off.

3. Extension of clean-out intervals from three to six weeks.

4. Elimination of the quarterly use of chemicals to reduce the scaling, because we use live steam in certain processes we could not use boiler additives, so we could only shut down for a week-end clean-out with chemicals occasionally.

Frankly, I don't know why this device works, but it does. Expert opinions I have sought were very discouraging, and yet the device continued to function. We are cautiously watching for any signs of corrosion or pitting now that bare metal is visible—and thus far can only say that we have yet to find any such danger signs.

We were extremely skeptical of this device and the claims made for it, but it does work, and we can prove it.

ALLAN J. LINDSTROM
Dodge Incorporated, (Manufacturers of Trophies), Los Angeles, Calif.

"We have yet to see one produce any benefits"

EDITOR—I think that if an article such as this had been called to the attention of the beverage industry some four or five years ago, a lot of our customers could certainly have saved some money.

We have been in the bottlers supply business for 30 years in Arizona, and we sell, as brokers, Water Treating for Water Conditioning, Inc., of San Gabriel, Calif.

We have seen these gadgets come and go and, when I say go, I mean they go because we have as yet to see one that actually has been of any benefit to the customers whatsoever.

I believe that all beverage journals should be interested in reprints of this article, and we think you people are to be congratulated on coming out and taking the bull by the horns and putting this information to the general public who are interested in water treating.

B. E. TADE
B. E. Tade & Co., Sales Agents, Phoenix, Ariz.

Neutral position may encourage further fraud

EDITOR—I receive WESTERN INDUSTRY regularly and often find above the average articles on very timely subjects. The November issue carried an especially appropriate and useful article, "The 'New' Water Conditioning Gadgets." I expect you thought seriously before writing your note at the heading of Mr. Owen's article and the one at the end, where you invited readers to reply.

I like your very neutral position in one respect, and in another way I fear that this approach may give encouragement to those who are out for fraudulent purposes as well as those who may be honestly mistaken. Mr. Owen, in my opinion, has done exceedingly well in writing this article. To me his statements are quite conservative.

RICHARD C. CROOK
Chief, Utilities, & Engineering. The Zia Company, Los Alamos, New Mexico.

"Knowledge . . . will convey a different impression"

EDITOR—Mr. Owen's article strongly derides all non-chemical water treating apparatus. The Evis Water Conditioner uses a non-chemical process for the correction of many industrial water problems. A knowledge of the Evis Process will convey an entirely different impression of the nature and usefulness of the Evis product than is found in Mr. Owen's article. Detailed information on the Evis Process may be obtained by writing the Evis Manufacturing Co. (40 Boardman Place, San Francisco 3.)

ARTHUR N. WELLS
Engineering Director, Evis Manufacturing Co.

"People have not changed from P. T. Barnum's day!"

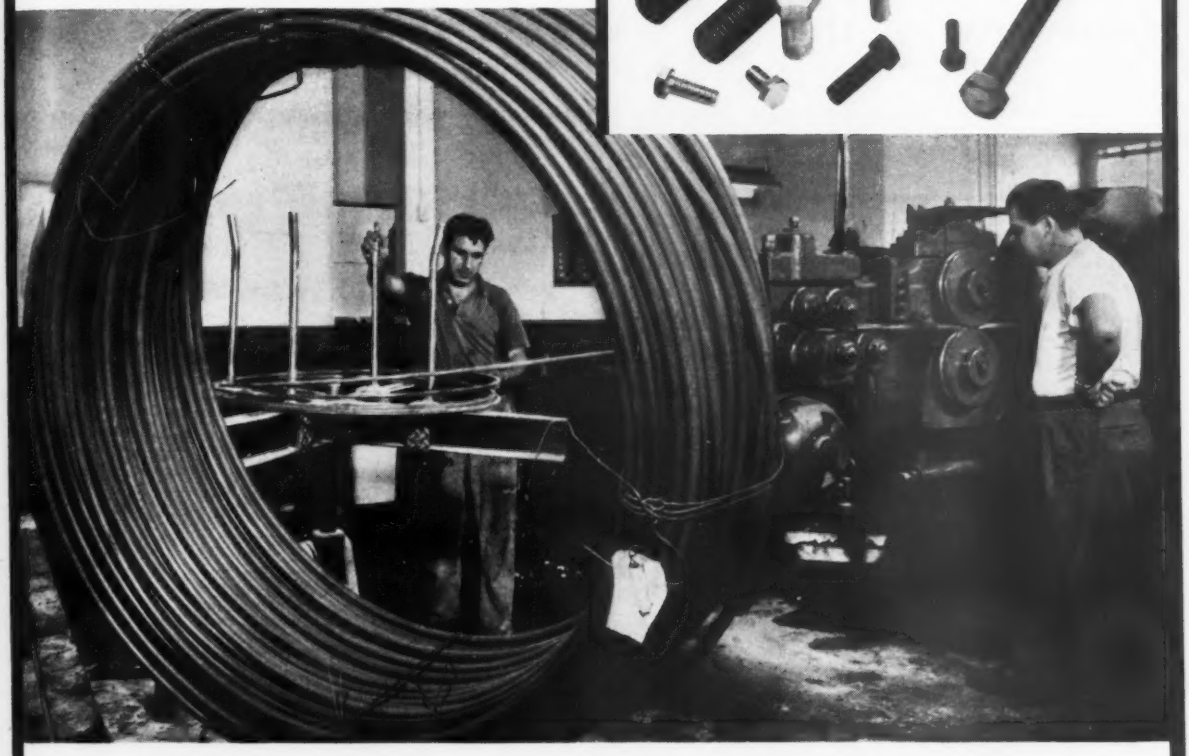
EDITOR—We in the Water Condition Research Council were very much pleased to see the article on "Water Conditioning Gadgets" in the November issue of WESTERN INDUSTRY. The findings depicted in this article are in agreement with the studies and laboratory work of the Research Council, all of which dates back to 1951.

I should like to point out, first, that if the Water Conditioning Research Council could find just one of these devices that actually worked effectively, *the Council would report that fact to the water conditioning industry as rapidly as possible and would encourage the industry to accept these devices as practical.* However, to date, our laboratory tests and tests by other leading water conditioning scientists have all indicated that these devices are worthless.

No one knows better than the promotors of these "gadgets" that P. T. Barnum was right when he said,

. . . continued on page 16

Russell Bolt Manufacturing Company, Los Angeles, is one of the West's largest suppliers of cold formed fasteners for the building and manufacturing industries. The bolts and screws displayed at right are but a few of many sizes, types, grades and finishes produced daily at Russell Bolt from USS Hot Rolled Rods (pickled, limed and drawn into wire).



USS Rods are your best protection against rejects

When wire drawn from USS Rods enters Russell Bolt's new ¾" header (above), the slightest seam causes stock to split during the upset heading operation. This is easy to understand considering the terrific pounding wire undergoes on its way to becoming bolts. Russell Bolt uses USS Cold Heading Quality Hot Rolled Rods as their best protection against rejects caused by split heads. These USS Rods have been metallurgically "tailored" for the best cold heading performance.

Whatever your product, this "tailor-made" quality can help you reduce rejects, set production running smoothly and on schedule. One call to Columbia-Geneva will put the West's largest rod and wire-making facilities behind your problem. *Rods and wire for every purpose from United States Steel.*

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Now... complete stocks, prompt deliveries of Aluminum rod, bar and wire from any of the 10 Western warehouses of

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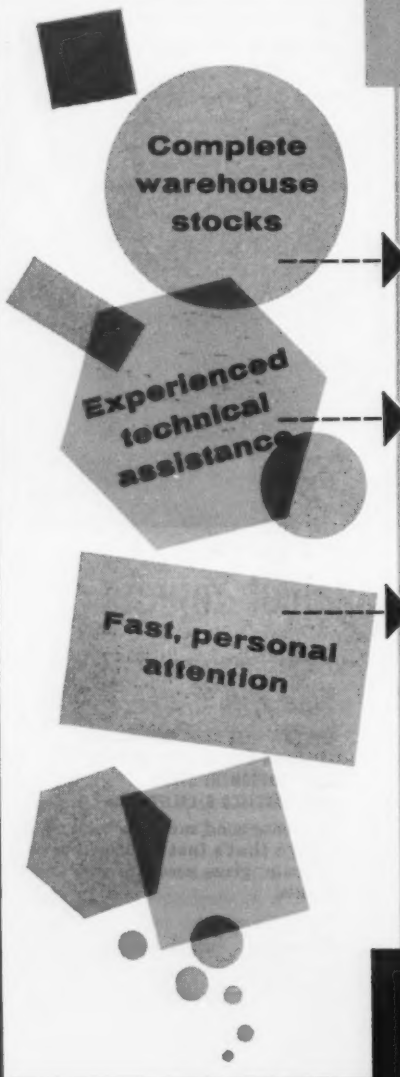

...of rod, bar and wire in all sizes and shapes are only a phone call and a short delivery time away from any Western plant or shop.

You can rely on Clingan & Fortier for fast, courteous Western service.., for regular shipments and emergency requirements that simplify your storage and inventory problems.

When you phone our customer service specialists, you talk with trained and qualified men who know the application advantages of aluminum rod, bar and wire in terms of *serving your particular needs best!*

On orders of any size...every time you need aluminum, phone your nearest Clingan & Fortier warehouse FIRST. You'll get the *exact* aluminum rod, bar or wire you need...*when you need it!* We believe our specialized aluminum service will please you and pave the way for *more* calls.

The number of Western plants and shops that have switched to Clingan & Fortier's combination of *specialized service and dependable quality* is growing steadily. Call TODAY!

ALWAYS CALL...

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... for more details, circle No. 9 on Reader Service Postcard

Automatic DOCKER...THE LIFT TRUCK

THAT WORKS WHERE OTHERS CAN'T

Shortest in its class... unmatched for easy maneuvering ...and for efficient low-cost operation

PAPER—Marcal Paper Company slashes loading time per boxcar from 12 man-hours to 1½ man-hours. DOCKER illustrated is equipped with rotating paper roll clamp for unloading and tiering 800 lb. paper rolls.

Illustrated are only a few examples of the DOCKER'S versatility. This extra-compact, more maneuverable truck offers more advantages than any other of its type for materials handling in any industry. It is especially desirable where space is limited... works with ease inside trailers, freight cars and in aisles too narrow for other similar trucks.

What's more, direct comparison shows clearly how definitely superior the DOCKER really is. Here are the figures:

	DOCKER	TRUCK A	TRUCK B	TRUCK C
2000 LBS. WITH LOAD LENGTH OF	48"	30"	40"	30"
SHORTER..... OVERALL LENGTH LESS FORK	53⅞"	65⅞"	65½"	64"
SAFER-EASY ON, EASY OFF..... STEP HEIGHT	7"	13"	13¾"	13⅞
MORE PRODUCTIVE..... LIFT SPEED F.P.M.	65	55	45	45
MORE VERSATILE..... GRADE CLEARANCE	45%	43.4%	45%	35%
MORE MANEUVERABLE... TURNING RADIUS	56"	59"	64"	57"
MAXIMUM HEAT PROTECTION. CLASS H, SILICONE INSULATED MOTORS—ALL MODELS	Yes	No	No	No

Send today for complete information including case histories of installations similar to your own.

Automatic

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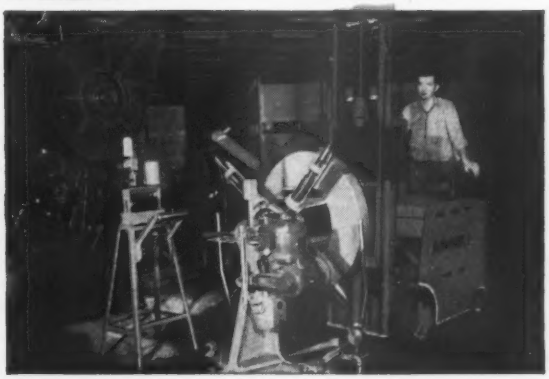
Chicago 20, Illinois

FOOD AND COLD STORAGE—Operating in temperatures ranging from plus 38° to minus 10° F. dependable Automatic DOCKERS working around-the-clock speed handling of perishable foods for Inland Storage Co. Fifteen cars at a time can be unloaded at the above dock deep inside this mammoth "deep freeze."



FABRICATED METALS—DOCKER is placing steel coil on an automatic feed device for a punch press in the new Briggs and Stratton Plant, Milwaukee. Throughout this plant, which is a model for plant planners, DOCKERS keep materials moving from receiving through production to shipping.

... for more details, circle No. 10 on Reader Service Postcard

LETTERS

. . . continued from page 12

"there's a sucker born every minute." Since 1951, the Research Council has been informed by the water conditioning industry of some 17 such non-chemical water conditioning "gadgets" of every size, shape, description and price. The promoters of three of them have been able to establish a market broad enough to attract industry attention.

One attracted sufficient attention to have the Federal Trade Commission cite the firm (in February, 1954) for false advertising; the case is still pending before the Commission as of this date. Theophile Vermeiren, the Belgian inventor of one such device, visited the Research Council headquarters in 1953, and promised that he would not promote its sale in this country until the device was tested and approved by leading water conditioning authorities and recognized scientists. It has never been so approved, but the device has found a fair-sized market in the U. S. A.

When Mr. Vermeiren returned to Belgium, the man who introduced him to a group of scientists at the University of Florida was sufficiently impressed that he immediately set to work manufacturing his own version of Mr. Vermeiren's "gadget"—and he neglected to get approval from Mr. Vermeiren! His sales technique is ingenius—for example: his company name is that of a well-known automobile, while his company's emblem is the former emblem of another well-known automobile in the same price class!

This week, we heard of a brand new concept in water conditioners—a device depending upon the strange forces emanating from a light bulb . . . A Michigan firm has just started selling it.

Times (and people) have not changed from P. T. Barnum's day!

RUSSELL D. LUND
Managing Director, Water Conditioning Research Council, Wheaton, Illinois

Conviction gained from the results obtained

EDITOR—In your editor's note in the 1956 issue, along with the article by Robert W. Owen discussing "water treatment gadgets," you requested statements from users of water conditioning devices. In order that your readers may benefit from your efforts to publish data concerning water-conditioning devices, we are enclosing some literature concerning the Ejax Water Conditioner, and letters from four typical users of this conditioner. We believe these letters speak for themselves, but we would be pleased to have you contact the writers.

We know there have been several devices on the market from time to time which were to end all water treatment woes. We run into them daily in our sales activity. We have made it our policy not to sell our unit since it must be serviced at various intervals depending upon conditions. Our unit is installed on a lease or rental basis—I am sure that you will be interested in the fact that we maintain a policy of installing a unit on a 60-day trial basis. If the unit does not perform as we contend, we will remove it and the installation has cost the customer nothing.

Ours is a plumbing business. We are not technicians or chemists, but we know of what we speak from results obtained.

HARRY WAREHAM
President, Wareham & Kessler, Inc., (Distributor, Ejax Water Conditioning Service) Los Angeles

"Buyers of gadgets get what they deserve"

EDITOR—I want to compliment you on the article on "water treatment gadgets" in the November issue.

All I have to add is that anyone who buys one of these gadgets certainly gets what he deserves.

HARLAN E. OEHLER
Plant Manager, Culligan, Inc., San Bernardino, Calif.

"Controlled experiments assess the usefulness . . ."

EDITOR—We offer our minimum criterion for judging the potential usefulness of any water treating device or process, as follows: *"Does the proposed technique yield an effect, preferably quantitative, demonstrable under experimental conditions?"*

If this simple condition cannot be met, it appears that it would be almost impossible to employ profitably the proposed procedure in the intricate field of water treatment.

Even fulfillment of the elementary requirement stated above does not, of course, necessarily guarantee the usefulness of the procedure in a given application. Rather, the skill of the water treating engineer is usually necessary in selecting which of the various proven methods—deionization, water softening by base exchange, hot lime soda, lime treatment, phosphate treatment, etc.—is best suited to solve the particular problem in the most economical manner.

With the ever increasing demands upon the very basic raw material water, both with respect to quality and quantity, it is only natural that a simple gadget requiring no maintenance would have a great deal of appeal, especially when it is claimed that installation of the device in the water feed line solves once and for all any and all water problems. But, hard experience mostly operates to disprove the efficacy of panaceas, whether applied to industry, health, politics or methods of getting rich without working.

Perhaps the basis for some of the claims made for devices based upon undefined principles undemonstrable experimentally arises from the effect of streaming in a system containing water upon focusing scaling and corrosion into certain areas. A simple rearrangement of pipes can remove scaling or corrosion from one area in a system and transfer it to another without influencing the accumulative effect in the slightest.

Hence, the desirability of controlled experiments as a point of departure in assessing the usefulness of a new water creating device or procedure is evident.

We cannot afford to assume a dogmatic attitude against the possibility of new and useful water treating methods appearing in the future and indeed devote a considerable amount of research time and money to develop and perfect new ion exchange resins and procedures for this very purpose. It is conceivable that scientific principles not yet discovered will find applications in the water treating field. However, unless in our experiments we can produce observable and measurable effects, we are forced to mark the work as simply another failure and move on to a new field of investigation.

B. N. DICKINSON, Ph. D.
Technical Director, Chemical Process Co., Redwood City, Calif.

Wanted: no brakes on the wheels of progress!

EDITOR—First, allow me to commend you for always opening the pages of WESTERN INDUSTRY to so-called controversial subjects. For many years, I have read this great publication and have always found the editorial policy open-minded. I would much appreciate being permitted to make some comments on "The 'New' Water Treatment Gadgets," as discussed in your November 1956 article.

Controversy has made the U. S. A. the greatest industrial power in the

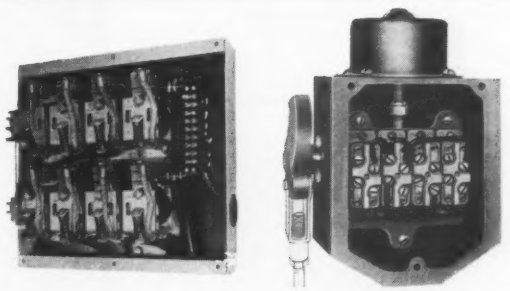
. . . continued on page 18

2,000 lb. Yale Electric Truck gives cartons a fast, smooth lift.

EFFICIENT YALE ELECTRIC TRUCK STACKS BOXES HIGH FOR FULL USE OF AIR-RIGHTS

This stacking operation is smooth and efficient because the Yale Electric Truck provides the operator with all the power he needs to do the job fast, with plenty of visibility for accurate load spotting and with a high lift for maximum use of air-rights. In addition, Yale's special clamp attachment eliminates the need for pallets... greatly reduces "lost storage space". Moreover, the space saved on pallet storage can now be used for other purposes.

Yale Electric Trucks will boost the efficiency and safety factor in *your* handling operation because you get dependable, high-rated performance year after year...truck- and load-stability under all load conditions... shock-resistant steering for extra handling ease in crammed quarters...and many other advantages only Yale Electric Trucks offer. Cap. from 1,000 to 150,000 lbs. For full facts write The Yale & Towne Mfg. Co., Philadelphia 15, Pa., Dept. 262A.



EXCLUSIVE YALE MAGNETIC CAM-O-TACTOR controls speed changes for smooth acceleration. Magnetic contactor unit *(left)* provides uniform contact action no matter how fast driver depresses accelerator pedal. Time delay setting in master accelerating switch *(right)* prevents jumping of speeds. Precision-engineered Yale Magnetic Cam-O-Tactor assures maximum dependability with minimum maintenance through simplicity of design.

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Developed to provide the ultimate of versatility, the May-Fran program of STANDARDIZATION permits users to create and construct their own conveyors to meet individual needs.

It literally provides a type of "super market" shopping for the straight, curved, inclined, take-up and discharge end sections required to meet the specifications of YOUR job requirements. Sections can be changed relative to length or width with only a minimum of downtime.

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MAY-FRAN ENGINEERING, INC.
1771 Clarkstone Road • Cleveland 12, Ohio

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LETTERS

. . . continued from page 16

world: Kerosene and gas-lights vs. electricity; carriages and buggies vs. automobiles; John Henry vs. the steam hammer. History repeats itself with inventions as well as with political incidents. It seems that certain facts in chemistry and physics are on tap; that is, consonant with the understanding prevailing. And if an inventor ignores the so-called facts, there's heck to pay.

For many years, blood-letting was the fact in medicine. Now we know better. Another classic example: the Wright Brothers and their heavier than air contraption, which all reputable scientists, mathematicians and professors of physics put in the category of the perpetual motion machine.

In view of these thoughts, I was frankly very much disturbed by Mr. Owen's presentation in the November 1956 issue, since it failed to point the way to progress in the field in which he is supposed to be an expert. For example, anyone with a real water problem like hot water pipes plugged with lime is left high and dry with no worthwhile solution to his problem. The entire article dealt with an unjustified condemnation of "gadgets" and the people who offer them.

As a general contractor, I can speak from years of experience since I have supervised considerable piping construction as well as its operation. I have seen many unusual deposits and corroded grooves in piping, and can truthfully state that no one ever offered me a logical explanation until recently. Although I have never used one of these "gadgets," and have never seen one in operation, I did get to read one manufacturer's literature. I found the causes of some water problems very accurately described. Also, I can see no objection to the idea of how the device works so long is it may be helpful to water users.

I understand these "gadgets" make no chemical change in the water, but they make a physical change in the sediments which separate from the water. If this change prevents scale without the expense of chemicals, it would certainly be a boon to industry.

In Mr. Owen's article, he admits the "gadgets" people have an accurate knowledge of scale and corrosion problems, yet he criticizes their approach in correcting these problems. I believe Mr. Owen's "unearthly forces" are more imaginative than informative. He has not convinced me that newly

. . . concluded on page 20

clear-span Soulé Buildings have more

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Space at low-cost
Space that's convenient

Space that's all usable
Space that's ready in days

No matter what your building need—manufacturing, fabricating, warehousing, transportation, commerce—you'll get more usable area with Soulé Buildings. That's because exclusive Soulé clear-span steel frames eliminate space-wasting interior support columns and overhead trusses. Every square foot of building area is usable. You can plan more efficient production or assembly operations, use money-saving mechanical materials handling (fork lifts maneuver easily in a clear-span Soulé Building). And a complete new Soulé Building can be erected ready for use within days!

Sizes to fit any need: **Widths:** 32', 40', 50', 60', 70', 80'; **Lengths:** multiples of 20'; **Eave heights:** 10', 12', 14', 16', 18', 20'.

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CM *METEOR* Electric Wire Rope Hoist

½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous hoist-duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control.

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HAND or ELECTRIC—CHAIN or WIRE ROPE

CM makes them all! So you can choose a hoist that's perfectly suited to your own needs in a safe, highly efficient CM design. Three of the most popular models are illustrated. Specifications of other types and sizes on request.

CM *LODESTAR* Electric Chain Hoist

⅛ to 1 ton capacities—First truly heavy duty version of small electric hoist. ¼ ton model weighs only 51 lbs. Heavy duty self-adjusting mechanical brake and regenerative electrical braking. Overload protection and upper-lower safety switches. CM-Alloy load chain.

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¼ to 10 ton capacities—Easy to carry and lift. One ton model weighs only 36 pounds. Made of tough aluminum alloy. CM-Alloy load chain. High efficiency. Lifetime lubrication.

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CM HOISTS AND CHAIN

... for more details, circle No. 14 on Reader Service Postcard

LETTERS

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developed "gadgets" won't work.

What boiling nails in glass apparatus, as depicted in Mr. Owen's article, has to do with rust and scale in boilers and pipes is a little vague, since boilers are not normally glass and nails are made of a different amalgamation and process from the metals in piping and boiler tubes. (Of course, no parasitic electric current would be involved). Such laboratory experiments are not tests in any sense of the word; for the true test of a product or instrument involves its use under the actual conditions for which it was designed to function.

As an example of "forward thinking" on the subject I quote the Honorable Abner E. Lipscomb, hearing examiner for the Federal Trade Commission, in his ruling dismissing a complaint after extensive hearing of false advertising against a water treatment gadget:

"From the record as a whole, it appears that we may here be confronted with a device operating upon a principle unknown to or unrecognized by present-day science. The strongest indications of this possibility lie in the scientific testimony in support of the complaint, wherein the scientists admitted that they did not understand the theory upon which the Evis Water Conditioner purports to operate, but that they would not preclude the possibility of such operation; and in Respondent Wells' admission that he himself does not yet fully understand the principle upon which his device operates, nor the potentialities thereof. In the presence of such a possibility, and of our conviction that the burden of proof has not been sustained, we must not take the risk of interfering with the development of a device which may prove to be the first practical application of a scientific principle heretofore undiscovered."

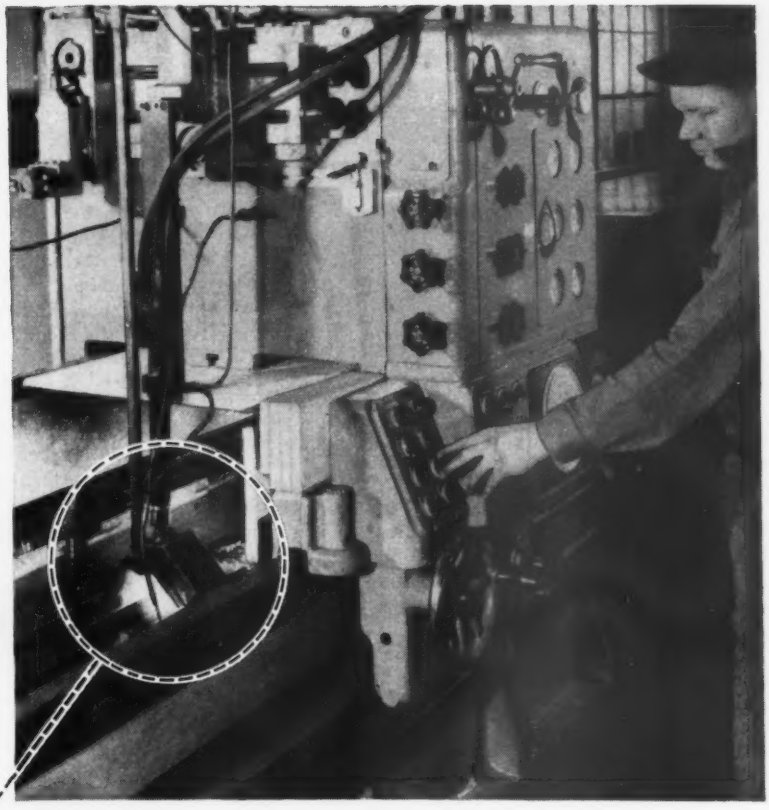
"We cannot, in this instance, justify the issuance of an order which might act as a brake on the wheels of progress."

No one would accuse Lipscomb of having to be a Solomon to reach this conclusion. However, in the face of the thesis by a small group in the so-called scientific community, that if they do not know about an apparatus or process, and cannot explain it, then it does not exist. It did take quite a bit of courage to end this controversy on the water treatment gadget.

I am not convinced that the "gadget" people are dishonest, uneducated or insincere. On the contrary, I believe there may be a new answer here to some of the common water problems.

JESS M. RITCHIE
President, Pioneers, Inc. (Also President, National Small Business Foundation), Oakland, California

HIGH SPEED FLAME-HARDENING



Cross-section view shows uniform depth of hardened surface.

SPECIAL MACHINE UPS LIFE OF GRAPHITIC STEEL PARTS

LINDE engineers have assisted Cincinnati Steel Treating Company in developing a flame hardening machine which increases service life of 16 ft. long, graphitic carbon steel lathe ways . . . Development of this automatic, high speed machine is another example of how LINDE Service Engineers are helping LINDE's customers up production speed and unit quality through co-operative research engineering.

With this new machine, a lathe way to be treated is placed on a magnetic chuck in a water filled channel. Flame-hardening heads and control mechanism move at predetermined speeds along the part. After it cools, the lathe way is placed in a refrigerator for 24 hours which stabilizes the steel, and brings its case hardness to a minimum of 60 Rockwell "C" scale.

The benefits of LINDE's research, engineering, and over 40 years of accumulated know-how stand behind each of its customers to help them solve production problems. Get these "plus-values" which LINDE offers—it pays you to do business with LINDE.

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LABOR NOTES for the West

ONE OF THE LONGEST AND STRONGEST LISTS OF EMPLOYEE "EXTRAS" you'll find at any industrial plant is helping a young and fast-growing Southern California firm hang on to top-grade employees in the area's highly competitive labor market. Right in the shadow of the biggest Western aircraft-missile makers, constantly on the prowl for engineering and production talent, Kwikset Locks in Anaheim started from scratch little more than a decade ago and has achieved considerable success and continuing growth—with a major share of the credit going to the firm's well-rounded employee benefit program and a "family spirit" management-employee atmosphere.

Still relatively an infant in the lockset business, Kwikset nevertheless today is the number one producer of residential locksets and is a pioneer in the field of powder metallurgy. In 1945, the firm started with a handful of personnel; by 1948, employment was up to 200; today, employment tops 800.

Key to Kwikset's employment success story is a well-balanced wage, promotion, and benefit program in behalf of employee welfare and security, adding up to an effort usually characteristic only of larger manufacturers. Here are the highlights of Kwikset's benefits:

A two-part profit sharing program—Under favorable profit circumstances, a cash bonus is paid share-and-share alike to all employees who have been on the job during the past fiscal year, with the bonus computed on the basic of an exact formula approved by the Bureau of Internal Revenue. Also, Kwikset sets aside a portion of company profits to accummulate for each employee until he reaches retirement age, computed on the same basis as the yearly cash bonus and payable on retirement in cash or annuity.

Company-paid pensions—For a retiring 25-year Kwikset employee (scaled down if less) the firm pays a pension equal to 25% of monthly wages usually computed during the period of highest earnings. This is in addition to the retirement profit sharing bonus mentioned above.

Five types of insurance—For almost every exigency, Kwikset has an insurance benefit. The firm pays insurance costs for each employee in a hospital and surgical insurance plan, providing up to $1,500 hospital expenses for a disability. The firm also pays the entire cost of state unemployment insurance. Group life insurance policies ranging up to $2,500 are available to all employees, with cost shared by the firm and the individual employee. Workmen's compensation insurance covers injuries on the job. These are in addition to accident or illness unemployment insurance required by the state.

A company credit union—Employees are provided with a savings plan with interest and a place to borrow money at low rates without going to commercial lenders.

Recreation and vacation boons—The company finances a program of intra-plant recreation and athletics as well as participating in community recreation programs. And the firm has provided a modern cottage camp in famous Idyllwild mountain resort for the enjoyment of employees and families.

Probably most important: "family spirit"—A number of activities and programs at Kwikset are aimed at increasing cooperation and "family spirit" among all personnel, including several communications programs, an internal publication for employees, employee-supervisor conferences, and others, so that all employees will be informed on the accomplishments of their company and its people.

There are other benefits too, more than can be mentioned here: a wage program aimed at keeping wages equal to or better than for comparable jobs in the area; an incentive wage program; careful attention to promotions and seniority consideration; bi-annual merit reviews for wage increases; some paid schooling on college level, etc. It all adds up to an ambitious benefit program of which even a much larger company could be proud.

●

"DOCTOR OF JANITORIAL KNOWLEDGE"—that's the new title you might be running into soon in a number of Western manufacturing plants. It's the result of a unique new training idea introduced by Easterday Supply Co., big wholesale janitorial supply company with offices in San Francisco and Los Angeles. Gained as a result of "Post Elbow-Grease" studies at this unique "Kollege of Janitorial Knowledge," the degree sends the man on the end of the broom or mop back to his job with know-how designed to make his job easier and more effectively accomplished.

GRADUATING "SUMMA CON MOPPA" In mock ceremony, Thomas De Caro, left, and Joseph Armienta receive their unusual degrees from Easterday's Bob Friedenthal.

The short intensive training course involves actual classroom and workshop sessions conducted by Bob Friedenthal, Northern California general manager for Easterday, Ted Mack, Southern California general manager, and other Easterday executives. Designed as an additional service to its customers, the course is offered on a no-fee basis. Demonstrations, films, slides, lectures—all the conveniences and methods found in a modern system of education—are employed to pass along latest sanitation techniques.

●

IT DIDN'T TAKE KAISER GYPSUM AND THE UNION LONG, relatively, to reach an agreement after Kaiser purchased strike-bound insulating board plants at St. Helens, Oregon. On January 14, Kaiser Gypsum and the Lumber

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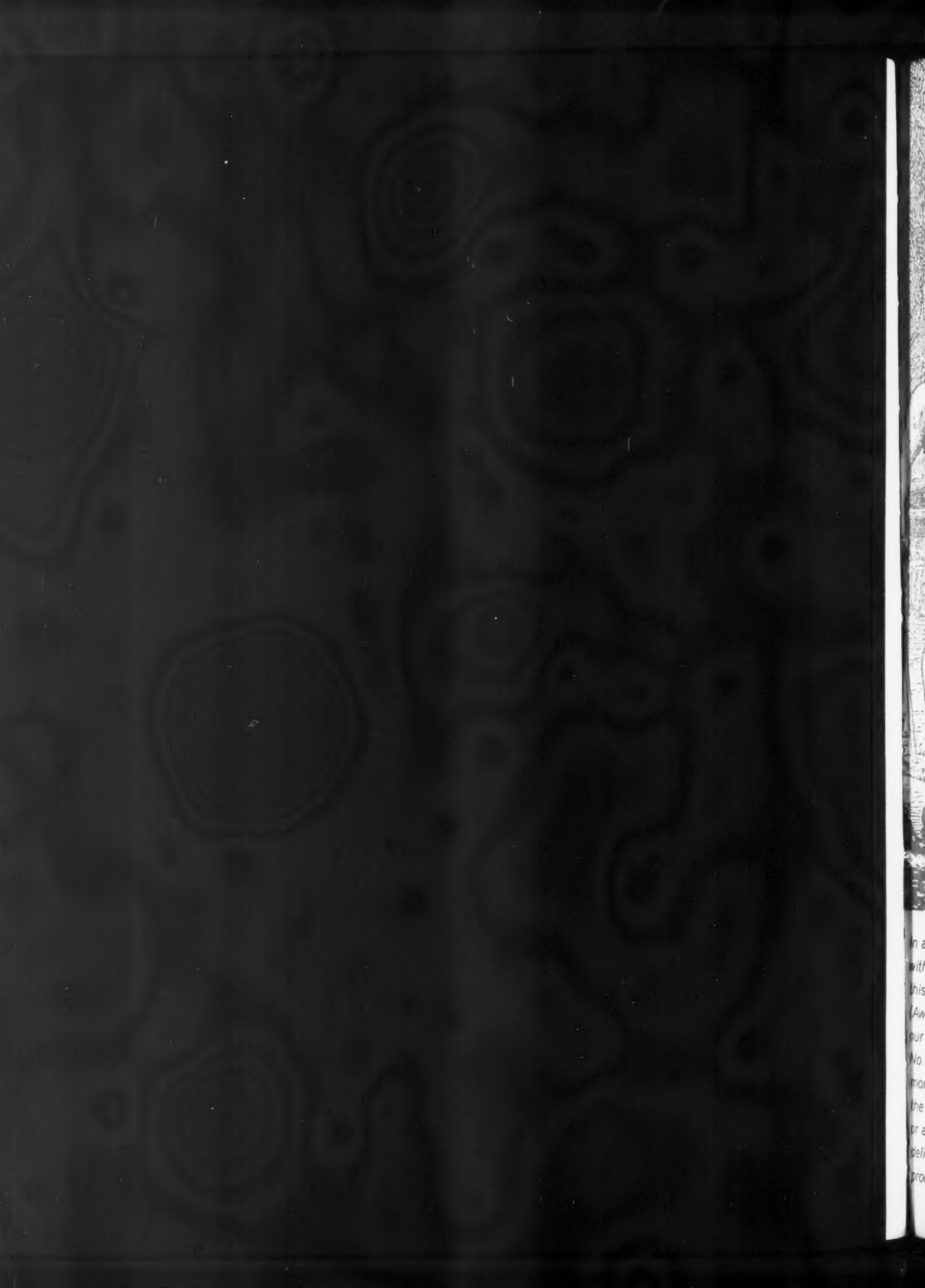
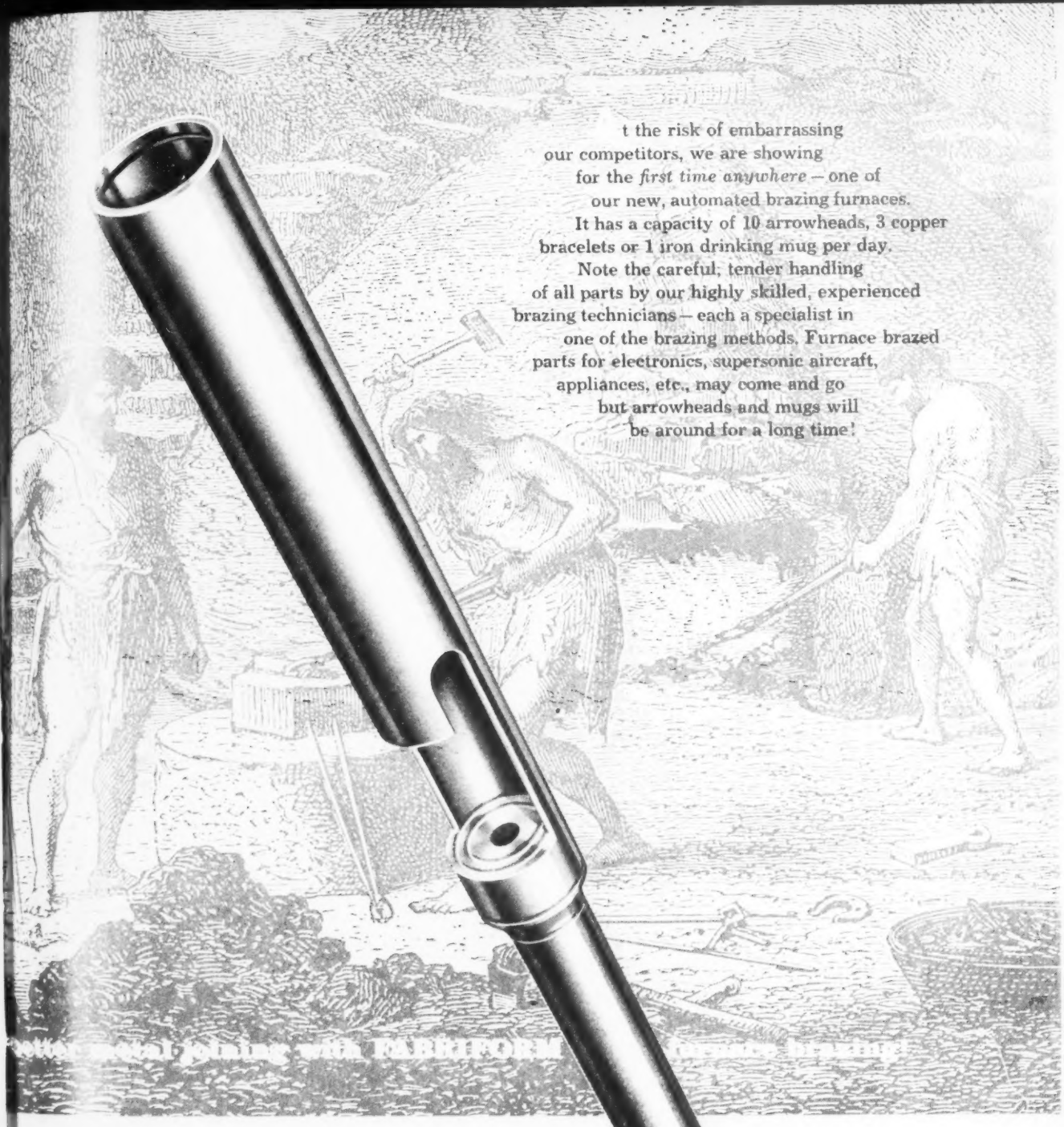
. . . *for more details, adv. opp. pg., circle No. 16 on Reader Service Postcard* ➡





t the risk of embarrassing
our competitors, we are showing
for the *first time anywhere* – one of
our new, automated brazing furnaces.
It has a capacity of 10 arrowheads, 3 copper
bracelets or 1 iron drinking mug per day.
Note the careful, tender handling
of all parts by our highly skilled, experienced
brazing technicians – each a specialist in
one of the brazing methods. Furnace brazed
parts for electronics, supersonic aircraft,
appliances, etc., may come and go
but arrowheads and mugs will
be around for a long time!

n an unprecedented burst of energy, "Shaggy Sam," the lad
with the chin foliage and hammer, managed to knock out
this complicated barrel for a CO^2 pistol in a matter of ten feverish weeks.
(Aw...we're just foolin' you—we really did it in a few minutes in
our high production, conveyor-type, dry hydrogen electric furnace.)
No wonder everyone is talking about how brazing is better...faster and
more economical than other metal joining methods. Regardless of
the method you are using now...send or bring a sample to us—
or ask for one of our engineers to call. We'll quote prices and
delivery you can't afford to pass up. TODAY...cut your present
production costs with ***Furnace Brazing.*** *Just write or call...* **LUdlow 7-7131**

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METAL PRODUCTS

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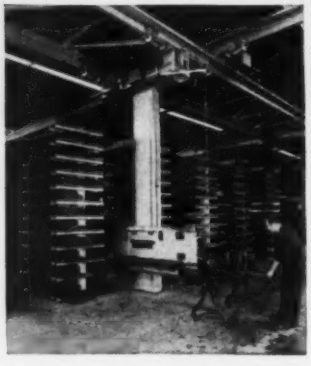
LOS ANGELES, CALIF.
Div. of George Getz Corporation

Neat, convenient and efficient steel bar storage stacked mechanically by the American MonoRail Stacker in narrow aisles

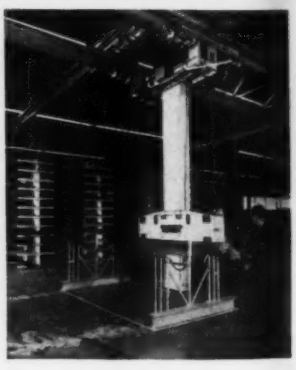
HOW'S THIS FOR STEEL STORAGE!

American MonoRail engineers, working with Hawkridge Brothers Company, designed this system for storing bars, rods and other long steel shapes.

Note the extremely narrow aisles and maximum height of racks. Bars and rods, 20-22 feet long, are placed in pans 18 feet long. The American MonoRail Stacker transfers these pans to either side of an aisle for storage.



MonoRail Stacker forks support bar in saw. Saw with extension rolls to any convenient spot in the warehouse.



American MonoRail Stacker lowers a banded bundle of bars over prongs which ingeniously splits bands, lets bars roll into trough for pick-up in a tray.

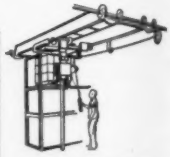
Photos: Courtesy of Hawkridge Brothers Company, Waterbury, Conn.

Member of Materials Handling Institute - MonoRail Association

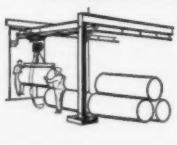
OVERHEAD HANDLING EQUIPMENT

AMERICAN MONORAIL COMPANY

AUTOMATIC DISPATCHER



STACKER CRANE



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6-ton Denison hydraulic Multipress is used here to press valve lever over shaft; then stake lever securely to shaft.

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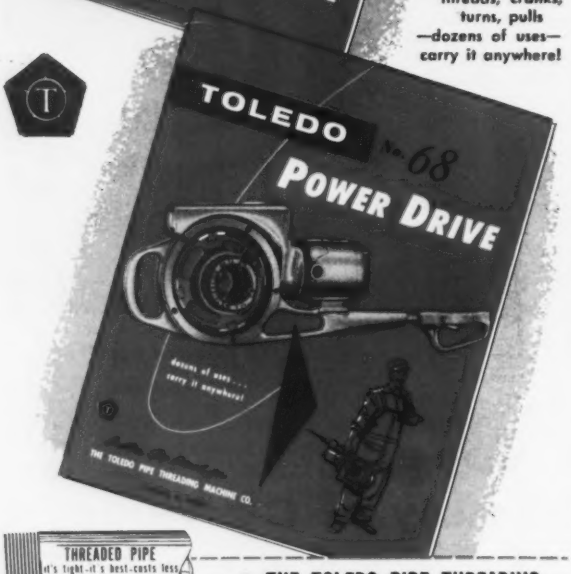

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LABOR NOTES

. . . continued from page 22

& Sawmill Workers Union signed a long-term labor contract covering hourly production and maintenance workers at the plants. The agreement was reached nine weeks after Kaiser's purchase of the plants.

Unusual was the fact that a strike had existed for 19 months before acquisition of the facilities by Kaiser.

The new agreement extends for more than three years, through May 1960, and provides for wage rates comparable to those paid throughout the industry. It also provides for a union shop, an annual wage re-opening, and extends to Kaiser Gypsum the use of the union label on a full line of nationally distributed insulating board products.

Things got rolling toward the agreement when Kaiser Gypsum recognized the Lumber & Sawmill Workers as sole collective bargaining agent on the basis of that union having signed up more than 85% of eligible employees following acquisition by Kaiser Gypsum last November 5.

•

CALIFORNIA FACTORIES EMPLOYED MORE WORKERS AT YEAR END than in any previous December in history, a fact that will surprise no Westerner. The changing pattern of employment is, however, of interest. In total, the California work force was 1,232,300 persons, 8% higher than in December of 1955. Almost every manufacturing industry boosted employment during 1956; aircraft, up 34,000; 20,000 increase in electrical equipment (including electronics); 11,000 more in ordnance, and 9,000 in machinery industries. Employment was lower than a year ago by small amounts in textiles, apparel, automobiles, and fish canning and preserving.

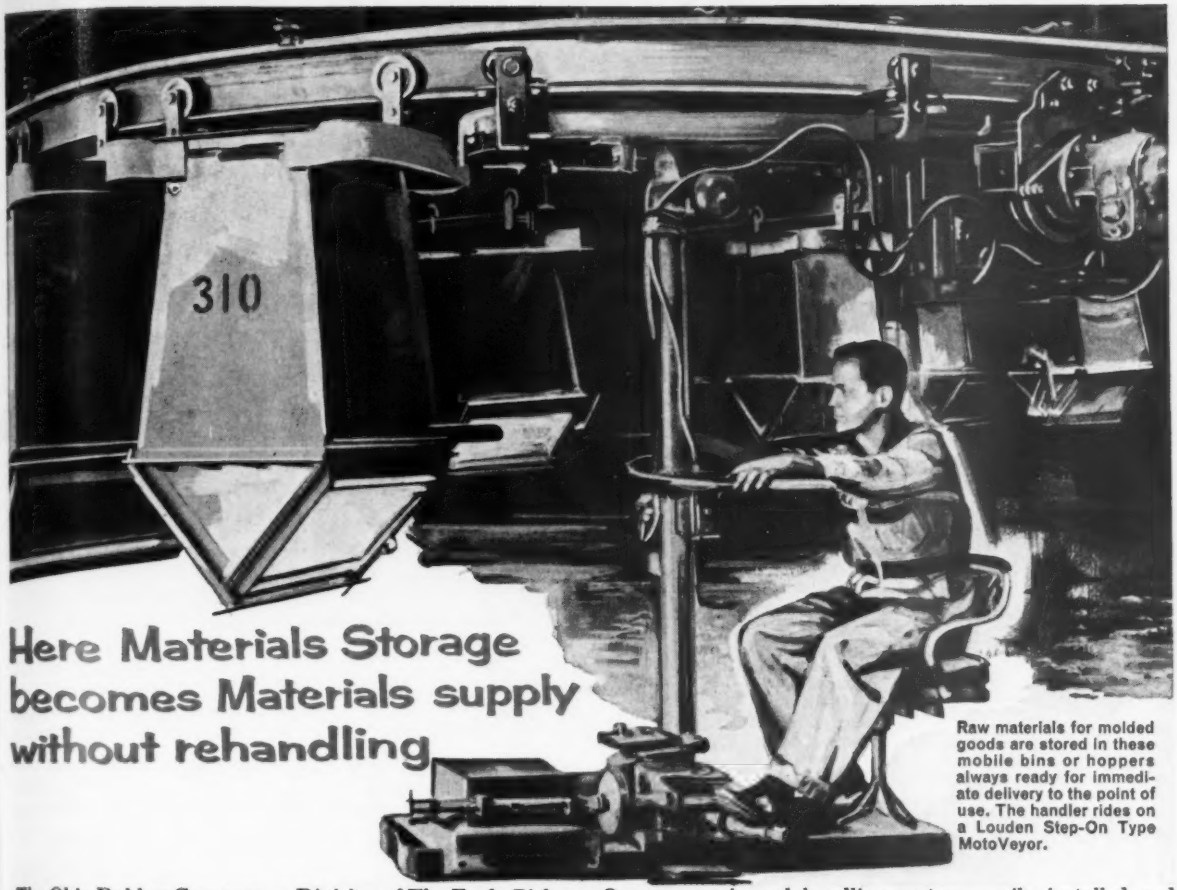
Employment in aircraft of 277,000 was at a postwar high, and accounted for about one-fifth of the total California factory force. Just one example of the reason why is provided by North American Aviation, which in mid-1956 had more than 50,000 on its Los Angeles payroll, double the number employed by the company during its peak World War II years.

•

LATEST PUBLICATIONS TO HELP YOU WITH YOUR LABOR PROBLEMS include the following, with source and price indicated in each case:

Occupation Wage Survey in Seattle, Wash., Area covers more than 60 major occupations common to all industries in the Seattle area ,and is the first such detailed report since September 1951. This report is dated August 1956, and includes data on supplementary wage practices, pension plans, etc. It's available for 20 cents from the U. S. Department of Labor, Bureau of Labor Statistics, 630 Sansome St., Room 802, San Francisco 11.

Appraising and Integrating Employee Benefits is a 24-page manual on this subject telling you how to define employee benefits, inventory your own set-up, steps in evaluating benefits, and the values of well planned benefits programs. It's written by Robert D. Gray, Director of the Industrial Relations Section at the Calif. Institute of Technology; available for $1.00 by writing to that school's "Bookstore," Pasadena, Calif.



Here Materials Storage becomes Materials supply without rehandling

Raw materials for molded goods are stored in these mobile bins or hoppers always ready for immediate delivery to the point of use. The handler rides on a Louden Step-On Type MotoVeyor.

The Ohio Rubber Company, a Division of The Eagle-Picher Company, uses Louden Monorail throughout their molded rubber goods plant at Willoughby, Ohio. One application of unusual interest and cost-saving effectiveness is the Materials Storage Department. This department not only uses but really consists of 2,500 feet of Louden Monorail track. Materials stocked for processing are here stored in mobile hoppers suspended from the trackage in this 90′ x 260′ indoor "monorail railroad yard." Loaded hoppers forming "trains" are made up to supply various materials as required. A Louden MotoVeyor moves them to whatever place the materials are needed, hoppers are dumped automatically, and materials fall directly into mixers on the floor below.

This is just one of the many handling problems that have been solved by Louden engineers. No other handling system permits such a wide diversity of uses as does Monorail. Over one universal handling system, easily installed and easily enlarged as occasion demands, your product can be handled from raw material to the wrapped package without one interruption to the smooth, even flow of production. Handling never becomes rehandling with Monorail.

When you have a materials handling problem or plant problem involving lifting and transporting loads, call on Louden for suggestions. Louden's unparalleled experience and proven engineering leadership combined with Louden's broad line of equipment can save time and mistakes. Write or wire today.

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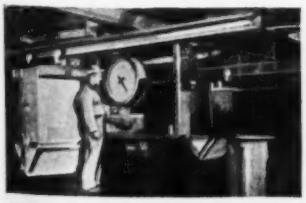
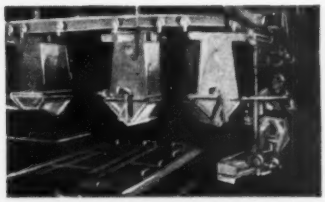
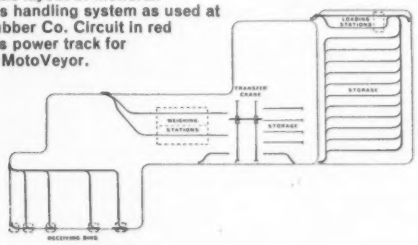


All loaded hoppers are weighed, marked as to contents and ticketed. This ticket provides both automatic inventory control and data for payroll computations.



Material is delivered directly from storage and automatically dumped into receiving bins feeding the mixers on the floor below.

Schematic layout of Monorail materials handling system as used at Ohio Rubber Co. Circuit in red indicates power track for Louden MotoVeyor.



Get the latest information on the best in modern materials handling systems. Write today for your copy of "Economical Material Handling", a 52-page book full of how-to-do-it ideas. If you are interested in automation, ask for the new book on Louden Automatic Dispatch, "Automatic Materials Handling". With either you will receive the latest information on Louden Shok-Pruf Electrification, new safety in power for cranes and monorail systems.

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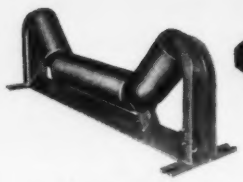
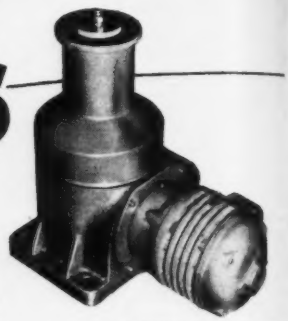

744-45° TROUGHING IDLERS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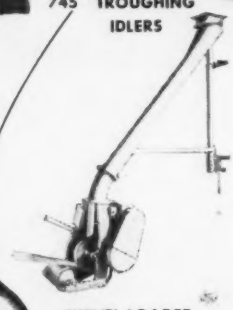
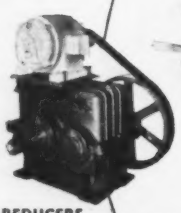

SWIVEL LOADER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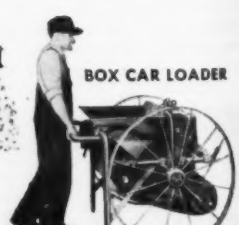
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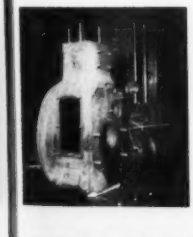
"EUTECTIC" WELDING HEADLINES - TIME - MONEY - MACHINERY SAVERS

FREEZING WEATHER—CRACKED MOTOR BLOCKS!
BETTER, FASTER REPAIRS WITH XYRON 2-24

Cracked motor blocks caused by freezing are no longer a winter headache—no longer an extensive and difficult repair job. Fast, permanent repair of cracked blocks is easy with Xyron 2-24, an electrode that permits "cold" welding of cast iron in all positions without dismantling heavy sections. Xyron 2-24's special "Frigid Arc" flux coating makes application particularly easy and its high tensile strength (up to 50,000 psi) provides welds with great resistance to wear and impact.

Repair should be accomplished as follows: Before welding, examine block carefully to determine exact extent of damage. Clean block thoroughly. Drill holes at each end of crack to prevent lengthening. Gouge a 75°-90° chamfer along edge of crack with Eutec-ChamferTrode, high-speed gouging electrode for all metals. Pre-heating is not necessary, but if maximum machinability is required, pre-heat to 400°F. Use AC or DC straight polarity and weld with short to medium arc at minimum possible amperage. Use skip welding technique to avoid overheating. Allow block to cool to hand heat between passes and peen to relieve stress.



Deposits of Xyron 2-24 are dense, machinable, and crack-free. Danger of warping, distortion, and stress is minimized or completely eliminated. In addition, Xyron 2-24 provides greater economy through lower consumption of material and shorter working time. Xyron 2-24 may be used to fill holes and build up missing sections and is suitable for grey and tempered cast iron and for joints with copper and steel. **(A-41)**

XYRON 2-25 ELIMINATES $1300 REPLACEMENT COST

Excessive keyway play cracked this $1300 cast iron roller wheel hub, but replacement was not necessary. Following the advice of Eutectic's District Engineer, a highway maintenance supervisor had the hub repaired at a cost of $100 with Xyron 2-25. A patented, non-cracking cast iron electrode, Xyron 2-25 welds all types of cast iron and cast iron alloys without the cracks, "leakers," and stress formations caused by conventional high heat cast iron electrodes.

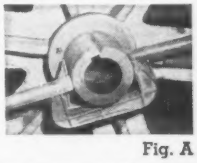


Fig. A

Damaged area of the hub was quickly gouged out with Eutec-ChamferTrode, high speed gouging electrode for all metals. (Fig. A.) After the vee had been finished by chiseling, Xyron 2-25 was used to build up the 1" wide and 1" deep groove. Weld deposit was dense, smooth, and machinable, free from cracks and porosities. Machining produced smooth finish shown in Fig. B.

Original cause of crack, excessive keyway play, was eliminated by building up the keyway with EutecRod 185FC, Bronzo-Chrom alloy rod that work hardens to BHN 200 and is fully machinable.

Fig. B

Wheel hub has been returned to service; welds have shown high resistance to wear and provided trouble free operation. **(A-44)**

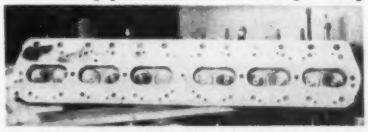
VALVES RE-FACED WITH EUTECTRODE 680 AC-DC SHOW AMAZING WEAR

EutecTrode 680 AC-DC has again demonstrated its amazing strength, long wear, and high heat resistance. Conventional high heat welding materials were previously used to re-face valves on compressor engines used in gas line pumping stations of an Arkansas pipe line corporation. After 2 to 3 months, conventional hard-faced overlays were cracked, pitted, and burnt out.

Eutectic's District Engineer recommended patented EutecTrode 680 AC-DC, all-purpose, high tensile electrode for very high alloy and carbon steels. Over one dozen valves were overlayed with a one-pass coating of EutecTrode 680 AC-DC. After one year's service, compressor engines were dismantled. Not one valve repaired with EutecTrode 680 AC-DC showed any trace of pitting or cracking. Valves were returned to use and the company expects at least another year's service from them. Ultimate tensile strength of EutecTrode 680 AC-DC is 120,000 psi. It can be used for all "problem" steels requiring the best possible weld qualities. **(A-42)**

ROLLS ROYCE ENGINE SAVED BY EUTECTRODE 2101

A collector of antique automobiles thought he would not be able to re-build the engine of a 1916 Rolls Royce because no replacement part was available for a badly corroded aluminum head. Then Eutectic's District Engineer suggested repair with EutecTrode 2101, whose exclusive "Frigid Arc" extruded flux coating produces a "Low Amp," easy to control arc. Deposits of this patented, highest strength aluminum electrode are smooth and dense, without spatter and porosities caused by conventional high heat electrodes.



After cleaning and preheating the head, the Rolls Royce owner used EutecTrode 2101 to build up corroded areas. EutecTrode 2101 permitted rapid deposits at lowest amperages with amazing arc stability. Welds have shown close color match and perfect corrosion resistance. Joints of EutecTrode 2101 are up to three times stronger than joints of conventional high heat aluminum electrodes. **(A-43)**

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WESTERN MEETING REPORTS

SAVINGS THAT CAN BE ACHIEVED IN THE FIELDS OF MATERIAL HANDLING AND PACKAGING will be detailed at each of the many sessions planned for the Annual Bay Area Material Handling and Packaging Conference at Stanford University Mar. 29-30. Sponsored by Stanford University and the San Francisco Chapters of the American Material Handling Society and the Society of Industrial Packaging and Material Handling Engineers, the program will get under way with a keynote discussion to be delivered by *Professor Grant Ireson*, who heads up Stanford's Department of Industrial Engineering. He will explain why it is necessary for industry to have an interchange of ideas on material handling and packaging problems through direct communications in conference.

All technical sessions will be concluded with participation of small discussion groups on key points of the subject at hand. More information about the conclave can be obtained by contacting *Neil D. Chaitin*, 110 Freeway Blvd., South San Francisco, Calif., or calling him at JUniper 6-1789.

•

"AN AID TO PRESSED-FOR-TIME OPERATORS OF MORE THAN 31,000 SMALL PLANTS IN THE WEST . . ." This was the view expressed by *Edward L. Turkington*, Regional Director of the government's Small Business Administration during a recent San Francisco interview regarding the Third Western Plant Maintenance and Engineering Show and Conference. While the show and conference are designed to be of help to Western plants of all sizes and types, *Mr. Turkington* explained why the events should be of particular interest to small plant operators. He stated that the concurrent events scheduled to be held June 11-13 in San Francisco's Civic Auditorium should, "provide operators of the West's small plants an opportunity to view and learn about the latest in plant maintenance and engineering equipment and methods. During the time between 1947 and 1954 the number of plants employing 1 to 19 persons increased in the West by 52%—almost 11,000 new plants. This is a rate twice that of the national growth in this category of manufacturing and processing facilities.

"The press of getting into operation and meeting previously-unheard-of market demands has stolen needed time from operators of these new plants . . . time that should be devoted to establishing better and more economical maintenance and engineering techniques. Any such show and conference should help the small businessman to retrieve much of that lost time.

"The Small Business Administration provides a great volume of technical material in leaflet and book form to help fill this gap in small plant operating abilities. This event should provide even further technical assistance needed by these busy men."

The show's producers, Clapp & Poliak, Inc., predict an increase in attendance of 2,500 over the 6,000 experienced at the last show held in 1955. Exhibits totaled 113 at the 1955 show and it is anticipated that this number will be increased 35% for the 1957 event. Details about either the show or conference are available at Clapp & Poliak's Western office, 681 Market St., San Francisco.

•

PLASTIC KNOW-HOW AND PRODUCTS will be displayed at the 1957 Society of the Plastics Industry Annual National Conference and Pacific Coast Plastics Exposition to be held in Los Angeles Mar. 18-21. First time the SPI National Conference has been held in the West, it will be headquartered at the Hotel Biltmore. Sessions covering plastics in the fields of electronics, aircraft and defense, packaging, building materials, appliances and sheet forming, plus latest developments for processing plastics, will be held each of the four mornings.

Also a "first" is Los Angeles location of the Exposition A regional trade show, it will be held at the Shrine Exposition Hall afternoons of scheduled dates and the evening of March 19. The show will be designed to meet the demands of plastics manufacturers and to provide an opportunity for companies in the plastics industry to display their wares to the Western industrial and commercial market. General chairman of both events is *J. Allen Carmien*, who is President of Nupla Manufacturing Co. in Los Angeles.

•

YOU WILL GET AN ADVANCE TOUR of the 10th Western Metal Exposition and Congress, scheduled for Los Angeles Mar. 25-29 (see calendar below), in the March issue of WESTERN INDUSTRY. Due to the importance of these events to Western plant operators, WI editors have contacted over 475 show exhibitors to obtain vital facts about equipment and materials they plan to display and the men who will be on hand to answer your questions. Also previewed will be the technical sessions of the Congress. Thus, if you plan to attend the events, you will get look-ahead data that will help you obtain the most for your time spent. If you can't make this important Western event, you will be able to gain much of the technical value to be gathered together without straying from desk or easy chair.

•

WESCON IS ON THE MOVE FOR 1957 EVENT in San Francisco. At a recent meeting held for purpose of setting major policies for the Aug. 20-23 show and convention to be held in San Francisco's Cow Palace, officers of the Board of Directors were elected. A new San Francisco Bay Area office has been opened. It is located at 60 West 41st Ave. in San Mateo and will be headquarters for the annual conclave of the electronics industry. Most recent move was forwarding of contracts to prospective exhibitors for the 1957 show.

The new San Mateo office of the 1957 Western Elec-

. . . Continued on page 32

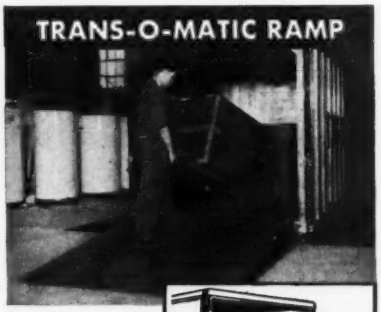
THREE WAYS TO *SPEED TRUCK LOADING*

"LIFT-PORTATION" EXPEDITES MATERIALS HANDLING . . CUTS COSTS

By JOHN R. QUEEN
Vice President and General Manager

No matter how snugly a truck is backed up to your loading dock, there is still a gap and a height variation between the truck bed and the dock. The operation of passing goods across this gap is costly, time-consuming, and can be dangerous.

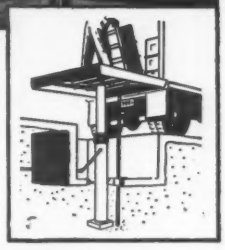
You can bridge this gap by using one of three modern mechanical loading devices manufactured by Globe Hoist Company. Each of these devices is easily installed . . . will pay for itself quickly by speeding the movement of goods in and out of your business establishment.



All too often the "standard" height above road level of shipping docks is either too high or too too low for most truck bodies. Hand trucks and fork trucks operate with great difficulty over makeshift ramps. Because of slow loading and unloading, trucks wait for platform space . . . costly delays result for shipper and receiver.

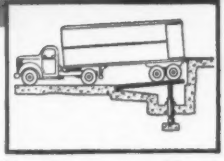
Installation of a Globe Trans-O-Matic Ramp provides smooth travel regardless of differences between truck bed and platform. Fast pushbutton control brings dock level to truck level. The Ramp's steel lip moves 15" up or down . . . floats with either rising or lowering action of truck or trailer floor. And you can handle two or three times more freight on your present dock area. Ramp sustains rollover weight of 20,000 lbs., storage loads up to 400 lbs. per sq. ft.

Designed to eliminate ramps, gangplanks, and manual lifting, Globe Platform Lifts permit fork trucks or hand trucks to be run on the platform at ground level and, after being raised by smooth hydraulic power, to run into the truck. Loads are moved on the level . . . accidents and breakage are minimized.



Globe Platform Lifts are low-cost and designed to fit most needs. Lifting capacities range from 5,000 to 80,000 lbs. Platform raises to 58", can be controlled either by air-oil unit or Globe Oil Pump.

Where it is more practical to position the truck or trailer, Globe Truck Levelers are used to raise or lower bodies so that beds are flush with platform.



Truck Levelers position the rear of a vehicle by raising or lowering the rear wheels. The unit consists of a sturdy hinged ramp powered by two hydraulic rams. A Globe Electric Oil Pump supplies the power. Size is 10x12 feet . . . lifting capacity is 40,000 lbs.

GLOBE®
PLATFORM LIFTS

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GLOBE PACIFIC HOIST COMPANY
1461 Canal Avenue WI-742-M-MH
Long Beach 13, California

Please send us complete information on Globe Trans-O-Matic Ramps, Globe Platform Lifts, and Globe Truck Levelers.

NAME.....
COMPANY.....
ADDRESS.....
CITY.....ZONE....STATE.....

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shelving is only metal until it is erected

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saves money from 1st day of installation

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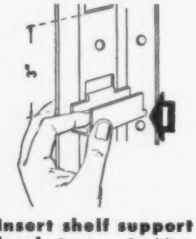
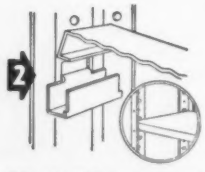
Borroughs ledge and door shelving installation, mimeograph supply room, State of California Personnel Board at Sacramento.



Insert shelf support bracket . . no fumbling with studs, bolts, nuts or lock washers.



Tilt shelf into support bracket . . and shelf is ready for loading.

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A Subsidiary of The American Metal Products Company of Detroit
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Paul W. Roeder Co., 2617 "J" St., Sacramento, Calif.
Sparkman-Barker Co., 550 Santa Fe Drive, Denver 4, Colo.

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WESTERN MEETINGS

. . . continued from page 30

tronics Show and Convention will also serve as Bay Area headquarters for the two sponsoring WESCON organizations. These are the West Coast Electronic Manufacturers Association and the San Francisco Section of the Institute of Radio Engineers. A complete conference area is available for meetings of group gatherings of the industry.

Chairman of the Board of Directors for this year's conclave is *Donald B. Harris*, manager of electron tube research at General Electric Microwave Laboratory in Palo Alto, Calif. Vice-chairman in charge of exhibit operations is *Norman H. Moore*, vice-president of Litton Industries in San Carlos, Calif. Vice-chairman of convention activities is *B. M. Oliver*, director of research and development at Hewlett-Packard Co. in Palo Alto, Calif. Other members of the board include *H. Myrl Stearns*, Varian Associates, as secretary-treasurer, and *Bruce S. Angwin*, General Electric Tube Div.; *E. P. Gertsch*, Gertsch Products, Inc.; *C. Frederick Wolcott*, Gilfillan Brothers, Inc., and *Hugh P. Moore*, Lerco Electronics, Inc.

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FIRST WESTERN AIR CONDITIONING, HEATING, VENTILATING & REFRIGERATION CONFERENCE AND EXHIBIT has been scheduled for May 3-7 at the Shrine Exposition Hall in Los Angeles. The regional exhibit will be held simultaneously with the regional conference of the American Society of Heating and Air Conditioning Engineers. However, other engineering societies and contractors' groups are expected to participate in informative technical sessions. First three of the five days scheduled will be restricted in attendance to those connected directly with the industry. Last two days will be open to general attendance.

•

WESTERN MEETINGS YOU SHOULD PLAN TO ATTEND

Feb. 17-20—CALIFORNIA TRUCKING ASSOC., state convention, **San Francisco.** Contact Wade Sherrard, managing director, 3301 So. Grand Ave., Los Angeles 7, Calif.

Feb. 18-21—WESTERN STATES MEAT PACKERS ASSOC., regional convention, **San Francisco.** Contact E. F. Forbes, president and general manager, 604 Mission St., San Francisco.

Feb. 26-28—1957 WESTERN JOINT COMPUTER CONFERENCE sponsored by the I.R.E., A.I.E.E., and the A.C.M., Statler Hotel, **Los Angeles.** Contact S. Dean Wanless, Public Relations Chairman, Aeronutronic Systems, Inc., 13729 Victory Blvd., Van Nuys, Calif.

Mar.4-6—ASSOC. OF IRON & STEEL ENGINEERS, regional convention, **San Francisco.** Contact T. J. Ess, managing director, 1010 Empire Bldg., Pittsburgh 22, Pa.

Mar. 13—FIFTH ANNUAL SOCIAL SCIENCE FOR INDUSTRY CONFERENCE, sponsored by Stanford Research Institute, Hotel Statler, **Los Angeles.** Contact Dr. Bertrand Klass, SRI, Menlo Park, Calif., or Jean Lotridge, SRI Southern Californian Laboratories, 821 Mission St., South Pasadena, Calif.

. . . continued on page 34

LOW COST DIFFERENCE BETWEEN

SKID

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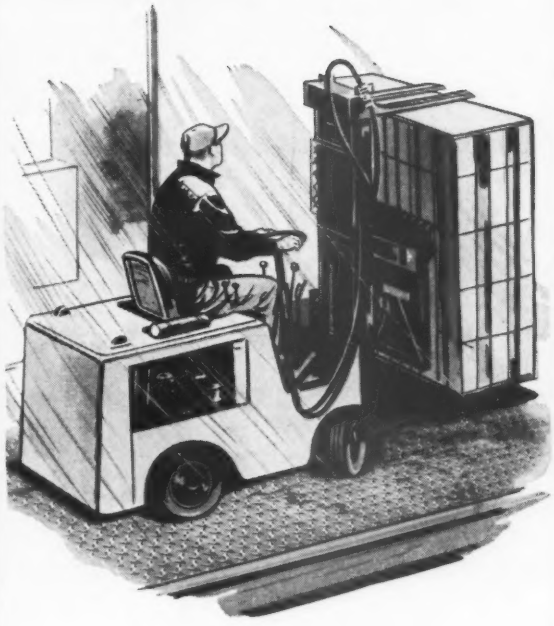

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- raised steel figures *diamond-shaped for maximum slip-skid resistance from all approach angles.*
- tough rolled steel floor plate for maximum industrial wear.
- non-directional pattern—no matching problems—minimum waste.
- easily fabricated with ordinary shop equipment for rapid installation.
- no maintenance problems—cleans, drains rapidly.
- use as independent flooring, structurally or as overlay.

For complete information write on company letterhead to Dept. SD-S14

No other floor plate can match A.W. Super-Diamond's safety and durability at so low a cost.

Pattern actual size

Wherever oil, grease, or other substances raise special slipping accident hazards, we suggest a check on the special non-slip qualities of A.W. ALGRIP—the world's only abrasive rolled steel floor plate.

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LIFT

the efficiency of your hydraulic unit with Roper dependable Pumps. Get optimum performance from the pumps that feature just two moving parts — equal size gears operating in a sturdy case with proper clearance for superior service and long life. The models shown are representative of standard Roper pumps suitable for most applications.

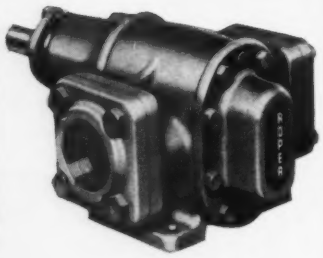
Specify
ROPER
Rotary Pumps
FOR YOUR
HYDRAULIC
APPLICATIONS

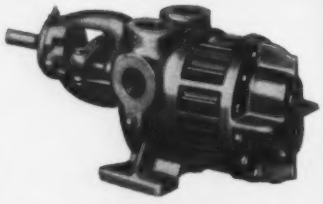
LOWER

maintenance costs with a Roper. For instance, a pump like the Series H with pressures to 1000 P.S.I., sizes 10 to 75 G.P.M. is ideally suited for hydraulic mechanisms and for other applications requiring high pressures. Spur gears run in axial hydraulic balance . . . bearings and bronze wear plates reduce friction under heavy loads. Available with packed box or mechanical seal.

PUSH

the unit in your hydraulic circuit with the correct size Roper for the particular job. In many cases the Series K will do, for it is rated from pressures to 150 P.S.I., capacities ¾ to 50 G.P.M. This model is compact, sturdy . . . is self-lubricated by liquid pumped . . . handles total suction lifts up to 25 feet. Comes with packed box or mechanical seal . . . with or without relief valve.





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GEO. D. ROPER CORPORATION
Pacific Coast Office, Pump Division
2011 Santa Fe Avenue
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PULL

favorable comment on a wise choice when you install a Roper as original equipment. Among the dependable Ropers is the Series F Pump — pressures to 300 P.S.I., sizes 1 to 300 G.P.M. It features four-port design with 8 optional piping arrangements . . . supplied in standard or stainless steel fitted models. With packed box or mechanical seal; with or without relief valve.

WESTERN MEETINGS

. . . continued from page 32

Mar. 18-20—FOURTH ANNUAL SAFETY CONGRESS AND EXHIBITS, sponsored by the Greater Los Angeles Chapter of the National Safety Council, Ambassador Hotel, **Los Angeles.** Contact sponsor at 3388 W. Eighth St., Los Angeles 5.

Mar. 18-21—SOCIETY OF THE PLASTICS INDUSTRY, INC., annual national conference, Biltmore Hotel, and Pacific Coast plastics exposition, Shrine Exposition Hall, **Los Angeles, Calif.** Contact society headquarters, 250 Park Ave., New York 17, N. Y.

Mar. 22-23—FIFTH PACIFIC NORTHWEST QUALITY CONTROL CONFERENCE, co-sponsored by Portland and Seattle sections of the American Society for Quality Control, Columbia Athletic Club, **Portland, Ore.** Contact A. G. Heizenrader, ASQC, P. O. Box 2001, Portland 14, Ore.

Mar. 25-29—AMERICAN SOCIETY FOR METALS, tenth Western Metal Exposition and Congress, Pan-Pacific Auditorium and Ambassador Hotel, **Los Angeles.** Contact W. H. Eisenman, managing director, Ambassador Hotel, Los Angeles 5.

Mar. 27-28—46TH ANNUAL MEETING OF WEST COAST LUMBERMAN'S ASSOCIATION, Multnomah Hotel, **Portland, Ore.** Contact WCLA, 1410 S. W. Morrison, Portland 5, Ore.

Apr. 4-5—EIGHTH ANNUAL INDUSTRIAL WASTE CONFERENCE, State College of Washington campus, **Pullman, Wash.** Contact Technical Extension Services, Pullman, Wash.

Apr. 9-10—12TH ANNUAL MEETING OF NORTHWEST WOOD PRODUCTS CLINIC, Davenport Hotel, **Spokane, Wash.** Contact John P. Krier, University Station, Box 111, Montana State University, Missoula.

Apr. 16-17—37th PACIFIC COAST MANAGEMENT CONFERENCE, regional conference, Claremont Hotel, **Berkeley, Calif.** Contact Everett Van Every, secretary-manager, Western Management Assoc., 2180 Milvia St., Berkeley, Calif.

Apr. 18-19—ANNUAL WESTERN REGIONAL CONFERENCE OF AMERICAN INSTITUTE OF INDUSTRIAL ENGINEERS, Hotel Del Coronado, **Coronado, Calif.** Contact John Senes, San Diego Chapter, AIIE, 95 King St., Chula Vista, Calif.

Apr. 24-26—THE SEVENTH REGION IRE CONFERENCE, Conference and Federal Bldgs. **San Diego.** Contact IRE Seventh Region Conference, U. S. Grant Hotel, San Diego, Calif.

May 7-12—19TH ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS, Fairmont Hotel, **San Francisco.** Contact William N. Wilson, executive secretary NAAMM, 228 No. LaSalle St., Chicago 1, Ill.

May 9-11 — INTERNATIONAL ASSOCIATION OF PERSONNEL WOMEN, national meeting, **San Francisco.** Contact Miss Viva Armstrong, Pres., c/o California Packing Corp., 218 Fremont St., San Francisco.

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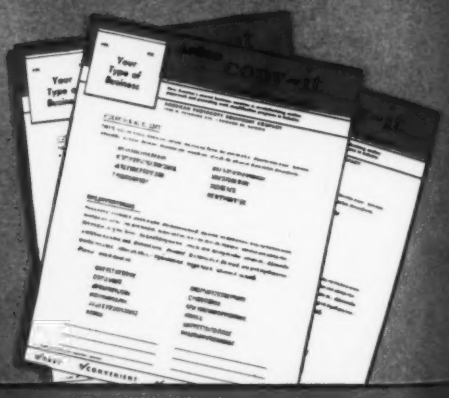

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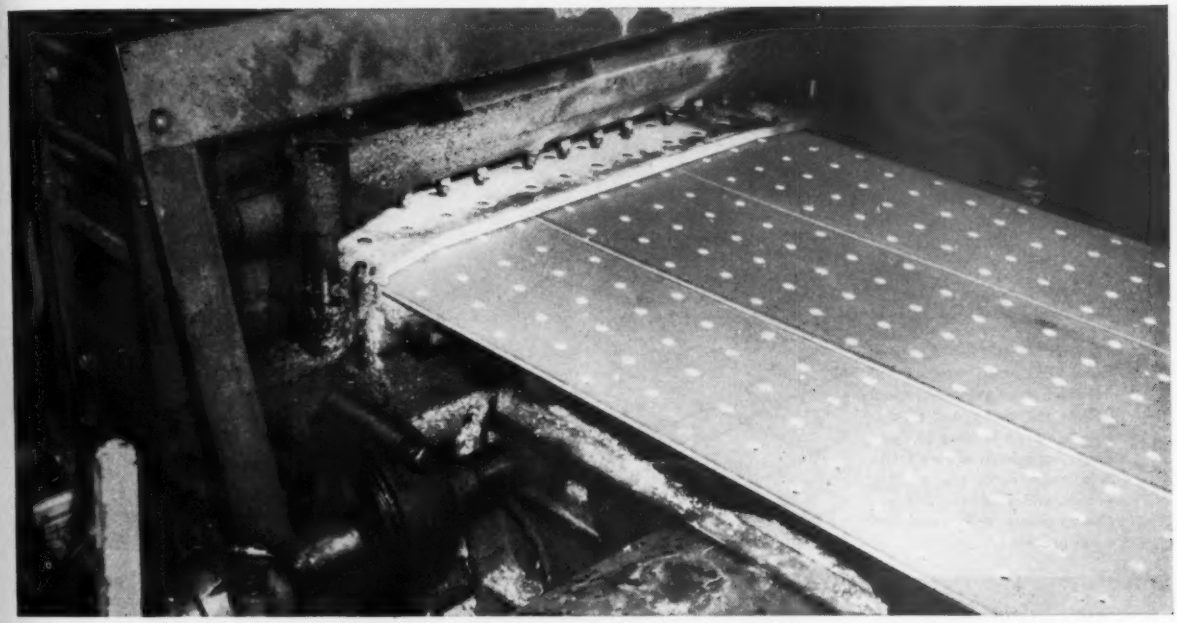
Standard Engineer's Field Report

CASE HISTORY
LUBRICANT *Calol Gear Compound*
FIRM *Blue Diamond Corp., Blue Diamond, Nevada*

Wet punch works 5½ years without gear loss despite extreme pressures and shock loads



BLUE DIAMOND CORPORATION, a leading Western gypsum producer, has rolled gypsum lath through this Ehrsam wet punch press 24 hours a day for 5½ years without a gear loss. Shock loads on this 500-pound punch exert extreme pressure on gear teeth, yet Calol Gear Compound keeps them in perfect condition. Even under these severe load conditions the lubricant protects teeth surfaces against galling and scuffing. Calol Gear Compound is available in eight grades to meet specifications of various gear manufacturers.

FREE CATALOG: "How To Save Money On Equipment Operation," will be sent on request to Standard Oil Company of California, 225 Bush St., San Francisco.

FOR EXPERT HELP on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative, or write to 225 Bush Street, San Francisco, California.

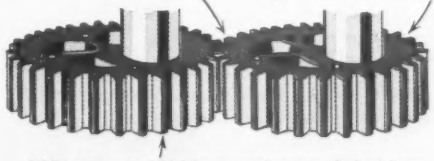
CALOL

TRADEMARK "CALOL" REG. U. S. PAT. OFF.

Why CALOL GEAR COMPOUND protects enclosed gears

Tough film protects gear teeth against scuffing and scoring under severe shock—load conditions

Highly adhesive... clings to gear teeth and bearings, even under the wettest operating conditions



Oiliness additive reduces friction

STANDARD OIL COMPANY OF CALIFORNIA

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REMINDER LIST
of maintenance steel products

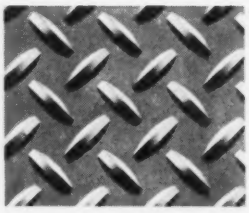
You can save time and trouble in the weeks ahead if you will take a minute now to review your coming requirements for maintenance steel products.

All the products listed below are in good supply at Ryerson right now, and, of course, we have many other maintenance products ready for quick shipment as well—boiler tubes, chain and accessories, tool steel, etc.

When you combine all maintenance steel requirements on one order you may save more than purchasing time. Freight costs may be lower, and prices, too, under the Ryerson quantity differential plan.

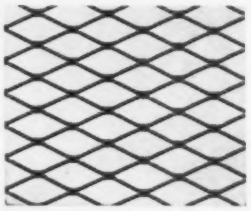
Perhaps this list will suggest ways to plan ahead and save

COLD FINISHED SHAFTING—Ryerson stocks of turned, ground and polished bars (C-1025, C-1045 and C-1141) provide a ready source for shafting of outstanding size accuracy, straightness and concentricity. For greater strength draw on Ryerson stocks of heat treated Rycrome—a medium carbon alloy.

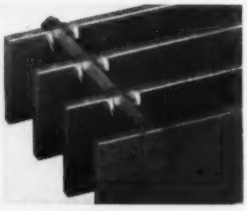


SAFETY PLATE—Tough, rolled steel plate with the Inland 4-WAY safety pattern is available in two pattern sizes for industrial flooring, stairs, ramps, platforms, etc. Firesafe, long wearing, easy to clean, it provides good traction for feet or wheels and presents an attractive appearance. Easy to fabricate and install.

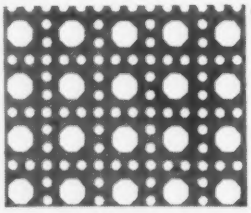
EXPANDED METAL—Furnished in two basic types, standard and flattened, Ryex expanded metal is light yet strong and rigid—easy to handle because all sharp edges have been removed. Use it for room enclosures, machine guards, grilles, shelves, bins, etc. Also available: Ryex expanded metal grating.



WELDED GRATING for strong, rigid and durable open steel flooring is available from Ryerson in stock size panels and sizes tailor-made for your job with all necessary cut-outs and banding. Easily installed and maintained, Ryerson welded grating can be furnished painted or galvanized. Send for engineering data.



STAINLESS PIPE & TUBING and fittings as well, are on hand in a complete range of types—304, 316 and 304-L for welding applications involving severe corrosion, and in a comprehensive range of sizes including schedules 5, 10, 40 and 80 pipe sizes. Valves and welding and screwed type fittings also available.



PERFORATED SHEETS are on hand for immediate shipment in standard cane and machine guard patterns. And you can also get quick service on a wide variety of other patterns perforated to order from large Ryerson stocks of carbon steel and stainless sheets and plates. Send for descriptive literature.

GALVANIZED SHEETS—Tight-coated galvanized that forms without flaking is available in a wide range of gauges and sizes. Sheets take paint or lacquer readily without "weathering." And for roofing, siding, etc. they can be furnished with standard corrugation or with the attractive new mansard corrugation.

GLYCO BABBITT METAL AND RYERTEX BEARINGS—Glyco Babbitt, produced in our own foundry from top quality virgin metals, is available in five grades to meet every babbitt bearing requirement. Ryertex plastic bearings which need only water lubrication can also be furnished promptly—in any size or shape.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, re-bars, machinery and tools, etc.

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. . . for more details, circle No. 29 on Reader Service Postcard

ACROSS THE DESK from dynamic Warren Hancock, president of HEC Corp., Redwood City, Calif., manufacturer of closed circuit TV systems, we got forward-looking answers to questions you would have asked in determining . . .

Can your plant use TV now?

TV in industry is fast becoming bigger business than its entertainment cousin. Here is the specific information about it you've wanted.

INDUSTRIAL PLANTS are discovering a profit-producing new tool in the form of closed circuit television. It is now possible to extend vision to areas where it would be hazardous to look with the human eye. One man operating a closed circuit television system may survey an entire plant area and, by pushing buttons, he may take a closer look at any desired point or area.

It is being predicted that the closed circuit television business will become larger in equipment dollar volume than the present entertainment television industry.

To get specific information on closed circuit television systems, WESTERN INDUSTRY editors consulted an expert—Warren Hancock of HEC Corp., Redwood City, Calif., manufacturer of the latest types of television equipment for industry.

We presented Mr. Hancock with some important questions, the same ones that we knew you would have wanted to ask. Here is the text of the interview:

Q. What constitutes a closed circuit television system?

A. A closed circuit television system consists of a camera, the synchronizer and control equipment associated with the camera, and a monitor. A closed circuit television system may consist of several cameras and several monitors. In some systems all monitors may display the same picture or each monitor may present a different picture. In some systems it may be possible at each monitor to switch to any of several cameras. It is also possible to select and control different lenses, to permit close-up viewing, etc.

Q. How much does a closed circuit television system cost, initially?

A. It is possible to purchase a closed circuit television system for less than a thousand dollars and it is also possible to spend several hundred thousand dollars for an elaborate system. The lowest cost system consists of a simple camera, control unit, and an ordinary home television receiver which is used as the monitor. This type of simple closed circuit television system will suffice for some applications. However, for the majority of applications, it would be wholly inadequate. A typical commercial grade camera chain which includes a camera, its control equipment and a monitor may be purchased for about $2,500 to $5,000 or more. In complex systems, one should plan on budgeting

DANGEROUS OPERATIONS can be watched via closed circuit TV and controlled from a remote safe location. Here, the camera is being positioned and focused on an operation involving an explosive device.

about $3,500 for each camera, about $500 for each monitor, about $2,500 for control equipment and, in some cases, additional funds for various switching and control devices and cabling.

Q. Is it necessary to employ specially trained personnel to operate closed circuit television systems?

A. No. Any person who can be taught to tune an ordinary television receiver, or to take pictures with a simple camera, can be taught to operate a closed circuit television system. Of course, as in teaching a person to drive an automobile, for example, some training must be given. However, many makes of closed circuit television systems are provided with controls which are so clearly identified that a person who has never operated such equipment but who is familiar with photography can teach himself in a few minutes to get useful results.

Q. Who installs and maintains closed circuit television equipment?

A. In most cases, the television equipment is installed by the seller and sometimes by the user under the supervision of the seller. An electrical contractor may do the work following the specific instructions furnished by the equipment manufacturer. Installation is generally neither costly nor complicated. In fact a telephone system is often much more complex. However, the installation should be done correctly in the first place. Some of the problems encountered by users after the equipment has been installed can be laid to poor planning and inadequate installation. Maintenance is seldom handled by employees of the users since very few industrial plants employ electronically trained personnel.

Maintenance work is generally handled by outside contractors who have the proper equipment and who have persons with specialized training in the maintenance of closed circuit television systems. Some service contractors handle maintenance for a monthly fee. The service may include prevention maintenance on a regular schedule, plus emergency maintenance when and if needed.

Q. What about the cost of lighting? I have heard that the cost of power for lighting for a closed circuit television system can be so high as to nullify the advantages of closed circuit television.

A. In the past, it has been true in some cases that lighting costs were prohibitive. However, recently developed cameras, like our Vicon IV model, are so sensitive as to be operable in most cases with existing light. For example, in a darkened room, it is possible to use only a single match for illumination to capture on television the portrait of a person. In railroad yard operations for example, and in other large outdoor areas, additional lighting may be required. However, using these more sensitive cameras, the lighting requirements are drastically reduced from what they were even a year ago. It is possible to provide remote controls which turn lights on and off as required. In fact, with the controls in a surveillance system in which the camera rotates automatically to scan certain areas, arrangements can be made for the lights to be turned on and off to illuminate only the desired areas as they are scanned. This control of camera and illumination can be completely programmed and handled automatically. Before discarding the use of television on the basis of earlier estimates for lighting costs, it would be smart to investigate these new, more sensitive systems, which require considerably less light.

Q. What about maintenance costs? I have heard that the camera tube in a television camera is generally short-lived and costs as much as an expensive automobile. Is this true?

A. The costs of maintenance of a closed circuit television system should in most instances be no more and, in many instances, less than the cost of maintaining a comparable number of home television receivers. The camera tube used in the television cameras employed in television broadcasting stations are reported to be short lived and cost about five times as much as the vidicon tube which is used in Hancock models. The life of a vidicon tube is estimated at 10,000 hr. For maintenance of closed circuit television equipment, a suitable amount of money should be budgeted. Initially, it is suggested that either the user of the equipment or the outside service contractor purchase about 10% spares. If there are ten cameras in the system, at least one spare camera should be available for substitution while one is being serviced. Likewise, other spares and replacement tubes should be provided. Most of the electrical and mechanical components of a properly designed closed circuit television system will not need replacement for many years. The major item of replacement is, of course, tubes. The maintenance of a simple closed circuit television system consisting of a camera and a single monitor should not exceed $10 or $15 per month on a contract basis. This figure may be higher, depending upon distance to be traveled and hours during which service must be rendered.

Q. How far apart can the camera and the viewing screen be separated?

A. It is entirely feasible, although quite expensive, to have the camera in San Francisco, for example, and the viewing screen in Los Angeles or Denver. When the viewing screen, or monitor, as it is called in the trade, and the camera, are in the same building, they are usually connected by a multi-conductor cable. In some instances, however, the television signal is transmitted over what would be called wired radio. A device is used which simulates an actual television station and the television signal is then transmitted as a radio signal through a transmission line to ordinary home television sets which serve as monitoring screens. A large number of these screens may be operated at the same time. When the camera and the monitor are to be separated by several miles, or are in different buildings, and it would be impractical to run cables across streets, the television signal may be transmitted over a leased coaxial cable or by means of microwave radio.

Q. Are cameras available which can stand severe punishment and which can be used in damp or corrosive atmospheres?

A. Yes. External housings are available in which a closed circuit television camera is installed. For some outdoor installations, the window of the protective enclosure is provided with a windshield wiper. Our new underwater television camera, for example, may be submerged in water or chemicals to depths of 500 ft. The camera is enclosed in a stainless steel container which has a small window at one end. The camera may be completely remotely controlled by an operator as far as 500 ft. away. The camera, by itself, without the stainless steel protective housing, is designed to stand extremes of shock and vibration and is resistant to most corrosive and moist atmospheres. It has been necessary to design what would ordinarily be delicate equipment to rigid industrial and military standards. In fact, it is under unusual environmental conditions that closed circuit television is most useful. The camera must often be installed in locations where it would be hazardous to look with the naked eye.

Jobs closed circuit TV is already doing, and can do for you . . .

1. **Observation of furnaces from a vantage point where heat would prohibit direct human vision.**
2. **Inspection of turbine blades, storage tanks, submerged objects, etc., by using an underwater television camera.**
3. **Surveillance of all plant areas for security purposes.**
4. **Observation of machines and processes by a minimum of personnel.**
5. **Remote viewing at one or several points of documents and records permitting storage of all records at a central location.**
6. **Checking of car numbers and inspection of rolling stock in freight and outdoor yards by personnel inside of an office.**
7. **Instruction of personnel at several points simultaneously.**
8. **Supervision of loading and unloading operations by personnel inside an office, with orders transmitted over loudspeaker systems.**
9. **Remote observation of smoke from chimneys.**
10. **Surveillance and supervision of parking lots.**

Q. Should I wait for color?

A. It all depends upon your particular television application. Colored, closed circuit television is available today, but at a very high price. It will be available, it is believed, in the near future at a much lower price. Such a system is now being developed. In most applications today however, black and white television provides adequate results. For unusual applications where color is a necessity, equipment will be available in the near future at a moderate price. In the meanwhile, black and white systems can be installed now which can later be converted to color.

Q. In operating a closed circuit television system, the pictures are seen on the screen while they happen, but then they are gone forever. In some operations, it may be desirable to retain the picture for longer scrutiny. What can be done to solve this problem?

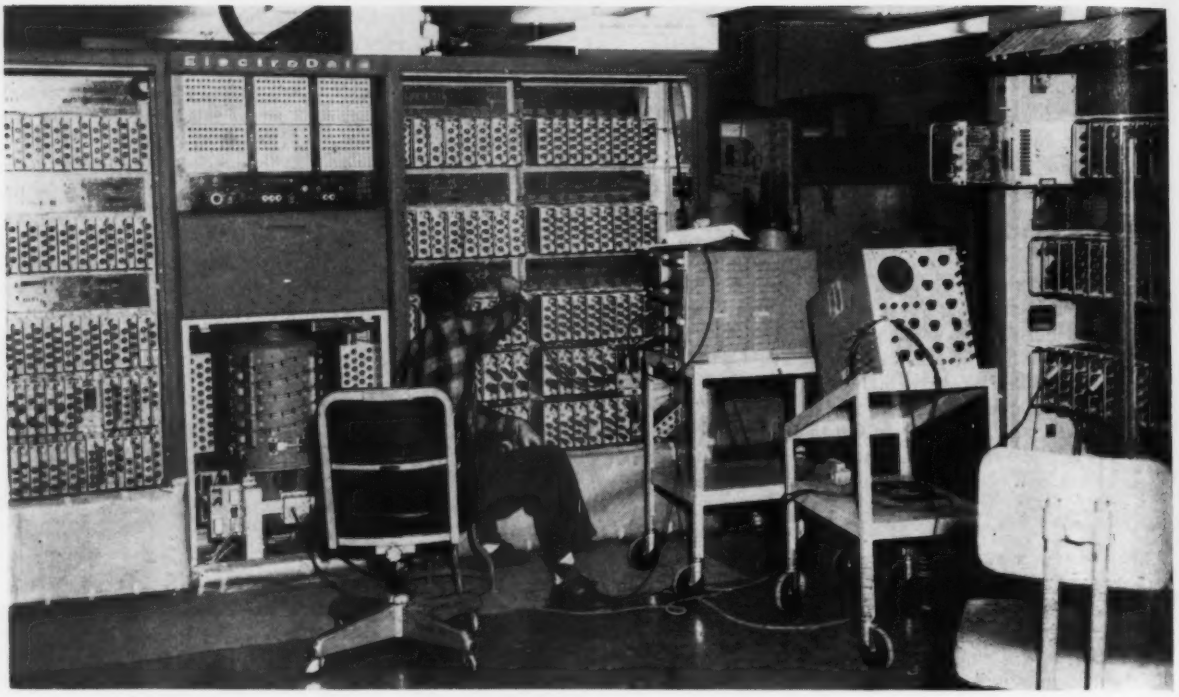
A. It is possible to provide on a custom-built basis, a special attachment to a closed circuit television system, using what is known as a memory tube. For example, if an operator is watching a sequence of operations and it is necessary or desirable to watch one of these operations for an extended period of time, it will be possible, by using a memory tube attachment, to preserve any single scene for a few minutes or even a few months. At the moment the button is pressed which activates the memory tube, the scene that is taking place at that moment will appear on the face of the memory tube and will remain there until erased electronically.

Q. So that we will have a continuing record, can we film or otherwise record the pictures captured by a closed circuit television system?

A. Yes, a kinescope recording can be made of the pictures received on the screen. However, a more flexible technique is to use a video tape recorder like the one recently developed by Ampex which permits the recording of televised pictures on tape. The pictures may be played back immediately, minutes later, or years later. Such television recording devices are currently in production.

Q. What does it cost to operate a closed circuit television system?

A. Not a great amount. The most significant recurring cost is for electrical power. A typical closed circuit television system requires about one kilowatt of power, which means that the power costs would run from 2c to 8c per hour, depending upon the power rate in a particular community. Maintenance and amortization, of course, are factors in computing true operating costs. Maintenance, when well designed equipment is used and is properly installed, becomes a minor item.



16 TEST STATIONS LIKE THIS ONE at ElectroData's plant and a 900-ton air conditioning system call for . . .

Top-notch power distribution

Here are details of the smooth system that provides plant power for a major California manufacturer of high-speed digital computers.

IT TAKES a sizeable and outstandingly effective electrical power distribution system to support the requirements imposed by manufacture and test of high-speed digital computing systems. For example, each Datatron unit manufactured at the Burroughs Corp.'s ElectroData Div. new 230,000-sq. ft. plant in Pasadena, Calif., draws about 60 kva. in test operations. 1,000 kva. must be distributed to 16 computer test stations in the factory. Throw in the load imposed by a 900-ton air conditioning system and such normal requirements as are presented by illumination, and you have need of a top-notch electrical system. Here are the highlights of the system that keep ElectroData humming.

Design and choice of equipment for the system followed four basic objectives: (1) operating economy, (2) reasonable construction costs, (3) outstanding plant appearance, and (4) maximum operational reliability.

Electrical energy is purchased from the municipal utility company at 4160-v., three phase. Transformation from 4160-v. to 480/277-v. is provided through three-phase transformers installed in substations throughout ElectroData's plant. All transformers are of the safety type, requiring no masonry vaults. The 480-v. three-phase voltage is passed through circuit breakers to various distribution units in the plant.

Three principal voltages used

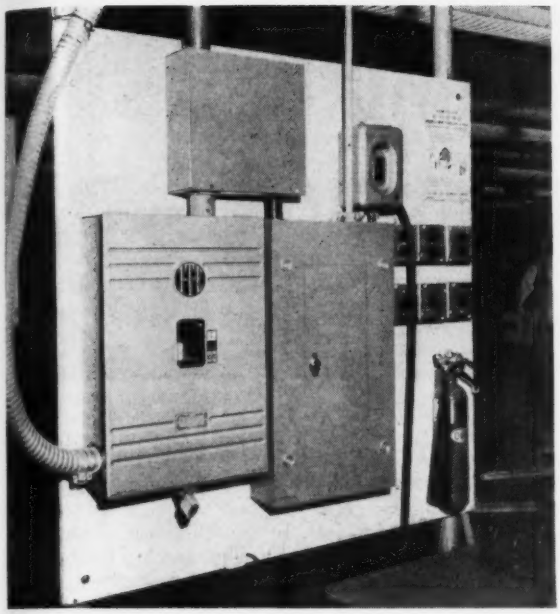
At utilization level three principal voltages are used. A three phase, four wire, 480/277-v. system supplies power to air conditioning motors and 98% of all lighting fixtures. Another independent 230-v., three-phase, three-wire system was employed to supply power to Datatron and allied equipment on test. Later this was changed to a four wire 120/208-v. system for greater flexibility.

Convenience receptacles, fractional horsepower motors and a few incandescent lamps operate at 120-v. The secondaries of small air-cooled transformers located in various areas of the plant provide 120/240-v. single-phase power.

By selecting a 480/277-v. system as the secondary distribution voltage, substantial savings were realized in the cost of low voltage switchgear due to the reduced number of feeders. Secondary switchgear is of the modern drawout type, to facilitate inspection and maintenance.

Branch circuit and panelboard costs were reduced because lighting systems, operating at 277-v., require comparatively few circuits. As the design of ElectroData's plant progressed, the idea of using two different types of fixtures for the office areas and for the shop was abandoned in favor of a louvered 10-ft. fixture with plastic sides, mounted on short stems and lamped with four, five-foot T-17 lamps. Maintained intensity on the horizontal surfaces averages 60 to 65 foot-candles and is up to 90 foot-candles in the drafting room.

Power for operation and testing of Datatron and peripheral data processing equipment is supplied through a



TEMPORARY CONNECTIONS can be made by production personnel working on equipment under test at many load centers such as the one shown here.

SMALL AIR-COOLED TRANSFORMERS provide 120/240-v. single-phase power. These are located throughout the plant and power is derived from their secondaries.

225 kva. to 208/120-v. transformer. This is distributed to various test stations and operates at each station through a 175-amp. circuit breaker. Circuits are connected when necessary to the computers through twist lock connectors.

Future transformer plans

In the future a 500-kva. transformer will be placed in the immediate test area for subsequent distribution to approximately 16 test stations. This transformer will be fed by a direct 4160-v. line, thereby cutting down the size of feeders and furnishing the same capacity at remote areas with less line voltage drop.

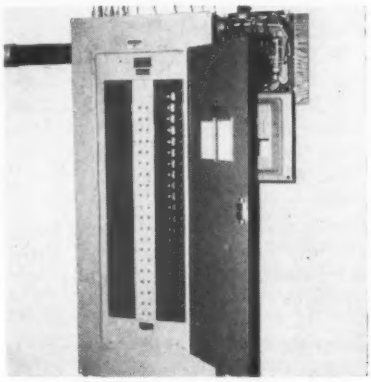
Incidental 120-v. outlets for the operation of bench lights, soldering irons and miscellaneous tools are supplied by 480/120-v. transformers of varying capacities. These are strategically located near the area of usage.

Throughout the shop area there are installed load centers supplying 230-v., three-phase 120/240-v., single phase and direct current at each load center. Temporary connections are established by production personnel from these load centers to the equipment under test.

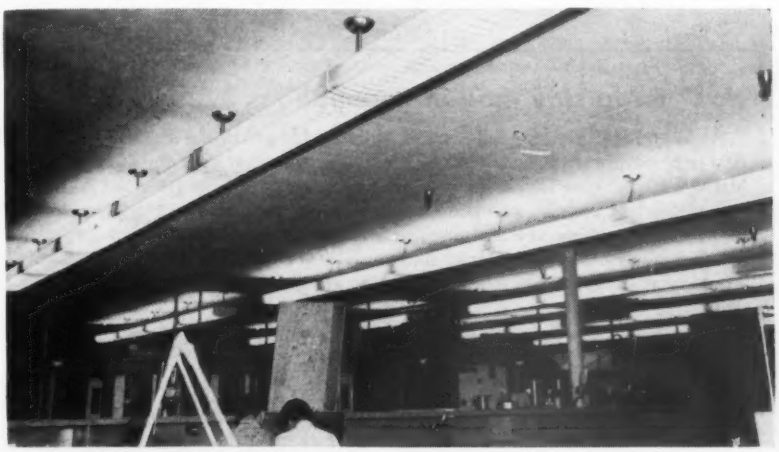
Temporary connections available

To provide for semi-permanent connections in the test department ceiling, mounted gutters are employed to house the wiring so that it may be readily rearranged. The use of gutters keeps the temporary wiring off the floor, improving housekeeping and increasing safety. Special underfloor duct was installed in the Data Processing Bureau where a permanent Datatron system is in operation at all times. Conventional underfloor duct for telephone and 120-v. outlets have been installed in the office areas, providing maximum flexibility in desk arrangements.

In addition to the standard reasons flexibility of desk arrangement is a valuable design point, ElectroData's rate of employment increase makes this point desirable. The firm now employs 10 times as many persons as it did when originated, a total of 350 workers.



CONVENIENCE OF LOCATION of distribution panels makes power control simple.



PLANT AND OFFICE LIGHTING FIXTURES are ten-foot, louvered fixtures with plastic sides lamped with four, five-foot T-17 lamps.

Employers no "sitting ducks" with multiple bargaining

Hard-won experience of the California Metal Trades Association puts a new face on industrial relations, especially for smaller firms.

"TAIN'T NECESSARILY SO" that the small company of 100 down to 50 employees or less must either be a sitting duck for a powerful union or the tail of a big, self-centered employer's kite.

Far from it, in the successful but hard-won experience of the California Metal Trades Association, which has proven out a method of multiple employer bargaining that has put a new and satisfactory face on industrial relations for its members.

This bargaining organization of some 300-odd molders, machine shops and foundries has the bulk of its membership about equally divided between San Francisco itself and the so-called "Metropolitan Oakland Area," where much of the newer industrial development of the region has gone, with the Peninsula, San Jose, Richmond and a few more distant points supplying the rest.

One vote each is the key

Each employer has only one vote, regardless of size. Therefore all members are on an equal basis.

This vitally important point is matched by another, the real key to success. When a contract for a particular trade is to be negotiated, each member of that group gives the negotiating committee power of attorney to act for him. Thus, he is legally as well as morally bound to live up to the contract. The result has been a united front that has gained the respect of the unions, so that both sides live up to their agreements.

Since each group hammers out its own master contract to suit its own conditions, molders do not have to team up with machinists, nor boilermakers with foundries in the same agreement. Consequently nation-wide patterns of the United Auto Workers or the Steel Workers have not been crammed down the throats of a variety of shops. Nor is one big plant the belwether for its group, with the small shops trailing meekly after.

The various and familiar form of work interruptions that make news for the daily papers, exasperation for the employer and bewilderment for the individual employee, have been done away with, as shown by the accompanying list of "employer benefits."

But have strikes and lockouts been eliminated? No, but they have been reduced to a minimum of what both employers and unions consider vital points. In the opinion of Association members, strikes and lockouts are the last-resort tools of collective bargaining. They are the catalysts that make the system work under principles of free enterprise, because there is no satisfactory substitute for the economic pressure that forces a sound and workable settlement.

Frown on public participation

Both the Association and the various unions with which it deals consider public participation in negotiations, when substituted for economic pressure, to be unrealistic and therefore unsatisfactory, because the points at issue are not given their natural weight. Instead, in the urge from the outside to force a quick settlement, minor matters tend to be given preference and the vital questions left unsettled.

Arbitration for questions arising out of a question is mutually acceptable. So also is mediation, when used as a means of keeping the parties together, face-saving and other touchy angles when negotiations break down. It provides a means for the parties to compose their differences, and the federal mediation service is looked upon as a useful feature of bargaining procedure.

Committees do the bargaining

Neither staff nor board of directors dictates the policy of the Association. Instead, they are coordinating bodies between the divisions, the directors being a working group who give many hours to this job every month in the year. Each division—molders, foundries, machine shops—is autonomous, but is morally bound to exchange information with the other groups.

Since the policy and negotiating

How not to stay mad in negotiations . . .

Al Wynn, business agent for the Molders Union in the San Francisco Bay area, ordinarily wears his hat while bargaining with the California Metal Trades Association. But on one occasion, a while after the union committee had angrily stamped out of the room and declared the negotiations off, there came a timid opening of the door, a red-faced but not-so-angry Al Wynn appeared—and the employers' committee realized he had left his hat on the table. He retrieved it, amid many chuckles.

Another time Bob Grunsky, managing director of the CMTA, arrived a trifle late and was busily engaged in taking notes and trying to catch up, when his committee jumped up out of their chairs and rushed out of the room. Not to be left alone, he started after them, jerked open the door, slammed it after him—and found himself shut in a closet.

committees of the Association must make the final decisions, they must be armed with enough information when they sit down across the table from the union representatives to present a reasonable and fair position. The committee must be able to answer intelligently the arguments the union puts forward, without weakening its position by having to refer matters back to the board of directors or the entire membership. Here is where good staff work counts.

Prompt action on grievances

Grievances, so often the cause of bitter conflict, are stamped out promptly. If an employer fails to settle a grievance promptly, a complaint from the union is followed by a quick reminder from the Association office. If this is insufficient, the offending employer is visited by a committee of his peers and the situation frankly discussed. If he refuses to accept an adverse ruling by the committee, the matter goes to a board of adjustment composed of other members of the Association, where the decision of the majority is binding.

If an employer prefers to stay out of a contract with the union, he is privileged to do so without losing his membership in the Association, and this occasionally happens. In-and-outers exist here, as elsewhere.

By including specific health and welfare benefits in the contract, instead of agreeing to pay money into a fund, both employers and employees have benefited. Unnecessary commissions have been eliminated, and administrative costs held down. Since each employer has to pay directly for the medical or surgical treatment involved, it is up to him to see that he gets the benefit he has promised the employee at an economical price.

California Metal Trades Association, according to its managing director, Robert R. Grunsky, does not claim to have reached the millenium in labor relations—no one has found the final answer—but its members feel that for the small employer this is a step toward making his union relationship an asset instead of a liability.

Beneficial to small employers

There is also the small employer's problem of survival, in an age when the United States is rapidly becoming a nation of industrial giants.

"The employer has almost identical problems to those of an employee," he says. "If a union works successfully for an employee, a 'union of employers' should be equally desirable, if the small employer is going to hold his position and not be smothered under 'pattern bargaining'."

How did the diverse groups that make up the California Metal Trades Association come to bind themselves together so tightly and satisfactorily? By hard experience, gained in the organization's 60-odd years of existence.

When formed, back around 1890, its program was a one-way street. The employers simply agreed among themselves what wages they would pay and posted notices accordingly. By 1902, it had come to be a different story, as the unions had gained enough strength, through bloody battles, to require union membership.

In the 1920s, the "American plan" appeared on the scene, an anti-union movement which brought about a situation where guns were carried and two foremen killed. Then came the labor legislation era of the 1930s, followed by the "Hook and Dillon" period right after World War II. These two suave, courteous but demanding leaders of the machinists' union built up a dictatorship which ended, like all dictatorships, in a solidified and victorious opposition to unreasonable union demands. In 1947, emerged the master contract of the California Metal Trades Association, which has functioned successfully ever since.

"Employer benefits" under the unique CMTA plan . . .

1. **No sit-downs**
2. **No slow-downs**
3. **No wildcat strikes**
4. **No sympathetic strikes**
5. **No broken contracts**
6. **No unions picking off the "weak sisters"**
7. **No big employers forcing a pattern on everyone else**
8. **No wage pattern for one area used as a lever on another**
9. **No grievances allowed to fester and to build up trouble**
10. **No cash pools of health and welfare funds inviting people to dip into them. Benefits — not money—are negotiated**
11. **No abandoning by the employer of his responsibility for giving the employee the benefits he has bargained for**
12. **No inflated health and welfare costs. The employer can drive his own bargain with the insurance company**

Active in apprenticeship

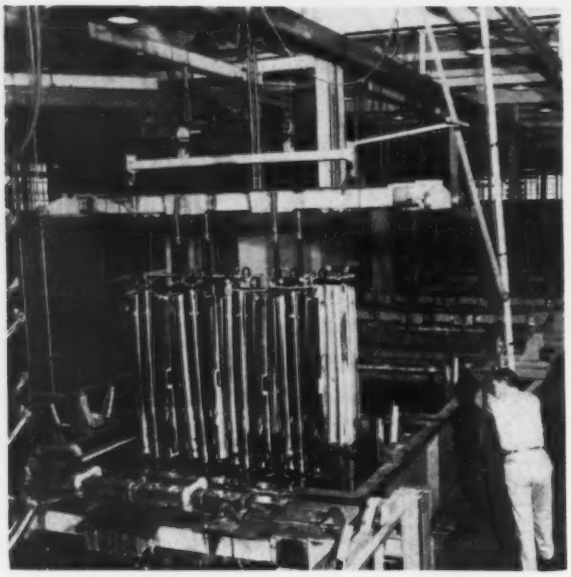
Conditions inside the various unions affect their relations with the Association. The boilermakers, for example, elect their business representative only once every four years. As a result of the continuity that has developed, plus outstanding union leadership, this union has not had to resort to a strike for 23 years. The machinists, however, elect every year and, with nine local lodges involved, politics plays a major role, and nothing in politics stays quiet very long. As a result, there have been numerous strikes in this field.

But, as wage contracts of themselves do not insure good labor relations and are only a framework on which to build, the California Metal Trades Association is equally active in certain constructive programs. Apprenticeship is one of these, recognizing that the average age of machinists is moving upward at an alarming rate and that employers cannot continue to live in an industrial community that borrows its skills from other areas or industries. In, this, there is 100% union cooperation, and the Association has nine joint apprenticeship standing committees, functioning as part of a state-wide labor-management apprenticeship program.

Safety committees sponsored

Safety has been recognized as another essential field of group employer approach to good industrial relations, instead of leaving it to the varying degrees of interest and responsibility of individual plants. Realizing that safety is basically a state of mind, not attained simply by the existence of good working conditions, the Association actively sponsors industry safety committees which include trained safety engineers. It also sets up periodic safety clinics in the field to stimulate employer interest in safeguarding the health of his employees.

A recent step in sustaining member interest in good industrial relations is a monthly luncheon panel session where outside experts as well as members discuss current problems.



160,000 AMP. OF DIRECT CURRENT are produced by germanium rectifiers to power plating tanks at Rheem's bumper works.

MOUNTED ON OVERHEAD CATWALK at Rheem are germanium rectifiers (right) and automatic voltage regulators.

GERMANIUM RECTIFIERS

New way to reduce power costs

Obtaining up to 85% full load efficiency, 5,000-amp. germanium rectifiers feed d-c power to Rheem Automotive's new bumper plating works.

WHAT is reportedly the largest installation of germanium rectifiers in the plating industry found its home in the West when Rheem Automotive Co. commenced operations in its new Fullerton, California, plant. The rectifier system provides d-c power to Rheem's semi-automatic bumper plating facility. Among other benefits derived from use of the germanium rectifiers is a reduced power cost stemming from the rectifiers outstanding full-load efficiency—as high as 85%.

Other advantages gained through the use of germanium rectifiers stem from the metallic element's high current density and excellent stability. Development of germanium equipment is particularly of current importance due to recent trends toward greater use of direct current from rectifiers to obtain the advantage of more accurate control, according to General Electric experts who developed the rectifiers in use at Rheem's new plant.

Examples of the many applications of germanium equipment are electrolytic cleaning, battery charging, copper refining, multi-circuit welding, arc light power supplies, aluminum pot lines, gas production, and many others. So, here is a development important to advancing Western plant operation . . . but, what is germanium? Before we take a look at how the rectifiers are applied at Rheem, here's a quick run-down on the metallic element that is opening new avenues to power and control problem-solving.

What is germanium?

G-E experts explain that germanium was discovered in 1886, but its industrial value was not realized until a few years ago when an intensified search for better rectifying materials got under way. Germanium never occurs in a free state; most of it is found in very small quantities (less than 1%) within the molecular structure of other minerals, such as silver, tin, copper, zinc and iron ores.

After locating the material that would solve their problems, researchers developed the germanium rectifier. The power germanium cell is made from a wafer, .020 in. thick, sliced from a highly purified single crystal of germanium. Metal discs are soldered to each side of the wafer, using indium as a constituent of the solder on one side only. The indium alloys with some of the germanium, creating a junction within the wafer and a "barrier layer" across which electrons flow far more freely in one direction than the other. Thus, a semi-conductor rectifying device is produced. This device, when properly cooled, can be operated at a current density approximately 1,000 times greater than a selenium disc, without any sign of aging.

Despite the fact that one of the first industrial germanium power rectifiers was installed by General Electric in a Western plant as recently as January of 1954, the past three years have seen General Electric sell germanium equipment having a total capacity of more than 75,000 kw. And development work has produced a wide variety of equipment ratings. Voltages up to 250 and higher are feasible with series cell operation. At the other extreme, units are available in air-cooled design for plating loads in ratings ranging from 6 to 24 v. at 750 to 5,000

amps. That's germanium as it is being applied in power rectifiers for modern plant operation.

Rheem's plating facility

Conventional straight line automatic plating is not desirable when curved parts such as bumper bars are being processed. This is particularly true at Rheem where many different shapes and sizes of bumpers are on the production lines.

Rheem's system provides a maximum of flexiblity coupled with high efficiency. To accomplish this, the plating equipment, powered by General Electric germanium rectifiers, was especially designed and built by the Udylite Corp. and its West Coast subsidiary. L. H. Butcher Co. Cleaning, pickling, nickel strike and pre-plate operations are completely automatic. They are combined with mono-tractor fed, cell-type, nickel and chrome plating tanks.

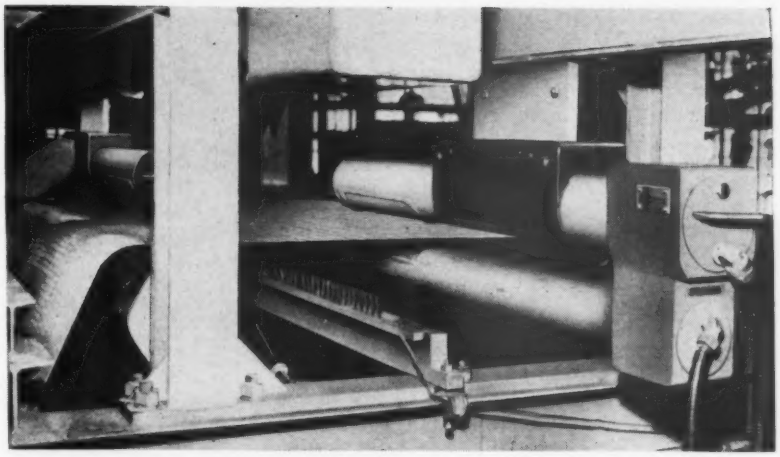
The nickel line consists of two sections each composed of sixteen tanks, 12 of which contain nickel plating solutions. Each nickel plating tank has conforming anodes and cathode bar agitation and contains 3,750 gal. of solution which is continuously filtered and heated by filters and heat exchangers.

Each tank is powered by a 5,000-amp. 18-v. germanium rectifier with automatic stabilized voltage control. The units are housed in eighteen 5,000-amp. cubicles, mounted on the plant's mezzanine floor. All nickel plating power units are thus easily accessible from the nickel plating line catwalk.

These 5,000-amp. cubicles, because of their compact size—they measure 21 in. wide by 6 ft. long and 6 ft. high—enabled a "building block" type arrangement designed for maximum flexibility and ease of maintenance.

The plant's two chromium tanks have a capacity of 3,750-gal. each. They are powered by two 15,000-amp. and two 20,000-amp. 15-v. germanium rectifiers. These rectifier units are floor-mounted.

All germanium cells are hermetically sealed from the plating room atmosphere, which could quickly cause corrosion to other types of power conversion equipment. The cells are forced air cooled to obtain adequate cooling at the high current density. Both cells and associated transformers are protected by thermal detectors which sound a warning when current or temperature limits are reached. If the warning is not heeded and limits are exceeded, the equipment is automatically shut down.



NEW RADIOACTIVE DEVICE, the Betameter, gages rubber sheeting at this Western plant. Rubberized fabric passes between arms (right) of the Betameter. Strontium 90, radioactive substance, is contained in the lower arm and emits beta rays through rubber sheet to upper arm.

Accurate gaging by a radioactive "eye"

HERE'S A WAY to utilize radiation from a radioactive source as a primary production control mechanism—proven out by tests at the Los Angeles plant of The Goodyear Tire and Rubber Co. Subject of the tests is the "Betameter" which, despite its name, will have little use at race tracks but should find a number of uses in industrial plants.

At Goodyear, the first Betameter produced is acting as a "seeing eye" in permitting adherence to close tolerances in the production of rubber sheet. Basically, the Betameter consists of a radiation source and a detector which translates radiation energy emitted from the source into an electrical signal. When a material is placed between the source and detector, a portion of the radiation is interrupted in direct proportion to the mass of the material.

The radioactive source, actual "seeing eye" of the gage, is made from strontium 90. This material is a fission by-product, one of the materials which can be separated from the "ash" formed when uranium fuel is burnt in a nuclear reactor. An automatic shutter isolates the radioactive source in case of power failure. It should be noted that beta rays have no effect on rubber nor does the rubber become radioactive.

Goodyear installed two twin sets of measuring elements on the tire fabric calendering pass line, one set after each of the calenders. In this way, the sheet is measured after coating one side of the fabric and again after the coating on the opposite side, providing thickness control on both sides.

The strontium 90 is contained in a chamber of one arm of the Betatron, and the beta rays that are emitted pass through the rubber sheet to be picked up by a detector in the opposite arm, there to be converted into the electrical signals that reveal the heaviness or thickness of the rubber sheet. A system for controlling the weight and thickness is also activated, with alternate measuring elements through a dual source system providing an across-the-machine profile or a point source system giving a detailed presentation. The operator can, at any time, incorporate the sheet profile onto his control chart by operating a selector switch. Signals from each of the four control heads are fed into the control consoles which, in turn, activates the calender roll screw down motor on either side of the calender stack to control thickness.

A big advantage of the installation is that the operator is now free to perform other duties while at the same time supervising the production of tire cord. Following this test, additional units are now being built for other Goodyear plants by Isotope Products Co., Buffalo, N. Y.

TAKE-OFF TIME—and 26 Douglas Aircraft men representing a cross-section of the first levels of supervisory management embark for a whirlwind look-see at the methods employed by Douglas suppliers in Michigan.

ON BOARD—not a typical plane-load of top executives, but instead an assistant foreman, production cost analyst, tooling engineer, etc.

Supervisors invade management realm

What happens when supervisory managers take over top management responsibilities? This "flying squad" of Westerners has provided some answers —with a unique experiment in the free flow exchange of information and fellowship.

THE DOUGLAS MEN were from its three Southern California plants at Santa Monica, Long Beach, and El Segundo. They were a cross-section of the first levels of supervisory management. Aboard the DC-3 were an assistant foreman for missiles inspection, a tooling engineer, a time and motion study specialist, a general foreman for tool fabrication, a production cost analyst. They had three major industrial relationships in common: They were Douglas management employees . . . they were intensely interested in learning better management practices . . . and they were members of the National Management Association.

How it all began

The story begins in the summer of 1956. O. L. (Lou) Rickards, an outside manufacturing representative in the Douglas Santa Monica plant, was having coffee with Bob Sweet, a magnesium sales representative for Dow Chemical Co.

Rickards and Sweet talked over the idea of establishing better industrial relations and exchanging information between management men in separately distinct industries. Douglas was an aircraft firm; Dow, a Douglas supplier, fabricated airplane parts but dealt mainly in chemicals and plastics, producing some 700 different products. Rickards and Sweet agreed that Douglas and Dow supervisory personnel were facing many of the same human relations problems, but what would it be from the technical end?

The pair set to work and enlisted the aid of top management in their respective companies. What would executive management think of a trip by Douglas supervisory management people to the Dow plant? Ordinarily that was a function of executive management only.

Dr. L. I. Doan, president of Dow, was an enthusiastic backer. So, too, were Donald W. Douglas, president and chairman of the board of Douglas and P. C. (Mac) McCutcheon, Dow sales training director. Douglas volunteered the use of his personal plane for such a trip. McCutcheon coordinated the operation at his end at the main Dow plant in Midland, Mich.

It was also decided the Douglas expedition should include a tour of another industrial organization in the Detroit area besides Dow. Chrysler Corp. executives in Detroit were contacted and acceded enthusiastically. The wheels were in motion for management men in the California aircraft industry to look in on how their counterparts in the 2,500-mi. distant

chemical and plastic, and automotive fields were operating.

The next question was, who was to make the trip for Douglas?

Why the NMA entered in

Lou Rickards is a member of the National Management Association, which has its national headquarters in Dayton, Ohio. It is a 31-year-old, non-profit, non-political, management educational organization with 70,000 members in 364 affiliated clubs representing 1,600 different firms. Douglas has four NMA clubs; Chrysler has two.

Originally, the NMA—formerly known as the National Association of Foremen—was composed entirely of first-level supervisory people. In recent years, however, its base has been broadened, and it now encompasses all levels of management. About 55% of the NMA members are foremen, or in the first levels of supervision; some 35% are in the middle management brackets, and 10% are top management.

In Southern California, the NMA has 15,000 members—and it has affiliated clubs at the Douglas Santa Monica, Long Beach, and El Segundo plants. Accordingly, it was agreed that the three clubs would provide equal representation on the trip, with virtually all tour members in the first ranks of management.

When the Douglas plane left Santa Monica that Wednesday evening, there were 26 Douglas management club members aboard.

What they saw and did

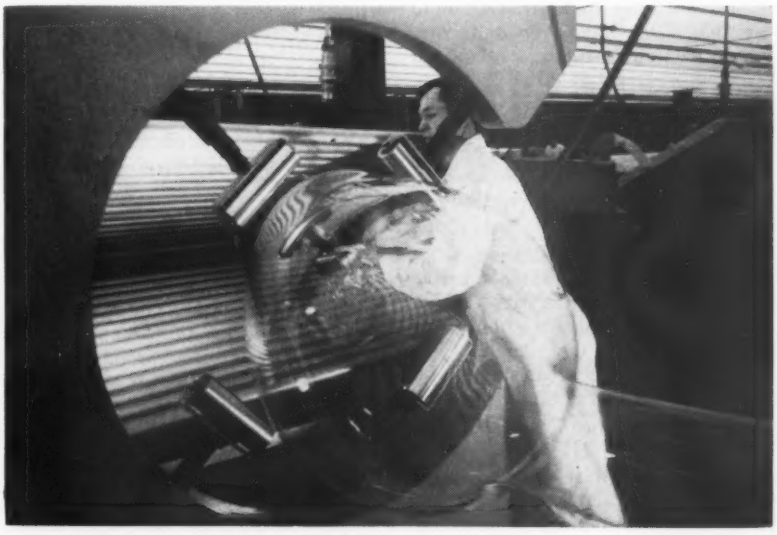
The itinerary was designed to afford the tour members an all-inclusive, if brief, look-see into the operation procedures of Dow and the Plymouth Engine Div. of Chrysler Corp. It should be added there is an 1,800-member NMA affiliate at Chrysler—the Automotive Body Division Management Club, but Dow does not have an NMA club. As Rickards phrased it, "We're representatives of Douglas Aircraft Corporation. And we're not trying to promote anyone. But if we can do a little NMA missionary work among our Dow friends, so much the better."

Thursday, the visiting Californians inspected Plymouth's final assembly line operation. New cars rolled off the line in incredibly swift numbers. It was an eye-opener for the Douglas people.

Thomas E. Diehl, a production cost analyst for Douglas Long Beach, looked on in fascination and spoke his feelings: "We're not geared in the airplane industry to this speed. Our problems are different. The planes we produce are subject to continual modification. Often, a plane will be finished and we have to start it back over the assembly line again to conform with new specifications. Also, planes which have been in service are sent back to us for up-dating."

AT CHRYSLER—the Douglas men picked up plenty of plant operation pointers even though fast-moving assembly line was unlike airplane assembly.

An intangible by-product of the tour was personification of the management unity concept by supervisory management personnel. This concept was heightened Thursday evening when the Douglas group attended the regular monthly dinner meeting of the Chrysler ABD Management Club. There, the Douglas representatives met socially with their Michigan counterparts—foremen, engineers, manufacturing representatives, factory staff assistants, executives—to talk over mutual problems and their solutions. J. M. (Jay) Jensen, vice president of the Douglas Santa Monica Management Club and an assistant chief liaison engineer, put it this way: "It's been a whirlwind first day, but I've



AT DOW—they saw an impressive display of what automation can accomplish, represented here by famous bubble from which Saran Wrap is made.

picked up more new plant operation pointers at Plymouth today and this meeting tonight than I've come across in some time."

Friday, the Douglas supervisory management group took off for Midland, Mich., and the Dow plants at Bay City and Midland, some 100 air miles from Detroit. The Douglas people were met by Dow executives, bundled into waiting buses on the crisp and clear fall morning and taken to the Bay City plant, 20 mi. from Midland. Approximately 2,000 people are employed by Dow at Bay City, where the company's fabricating and foundry operations are centered.

Some new ideas at Dow

Here, J. C. (Cliff) Page, an assistant foreman in the foundry at Douglas Long Beach, was much more at home than he had been the previous day at the Plymouth plant. Page said foundry operations were basically the same all over but he noted with critical interest minor differences in the Dow casting procedure.

Host for the Dow luncheon in honor of the Douglas group was William S. Loose, manager of magnesium sales for Dow, and the featured speaker was William R. Dixon, assistant general sales manager. Loose told the visitors it was the first time, to his knowledge, Dow had entertained a group of industrial management people en masse.

Dixon expounded the Dow company's philosophy: "We believe a company, just as an individual, has a personality. We take great pride in our organization. We believe in the promotion of good industrial housekeeping, that plants can be made both functional and cheery."

The Dow sales executive went on to say that "Dow employee and community activities often overlap" in Midland, a city of 25,000 population. He said, "Our executives live and work in these small communities, so their interest is real." Dixon emphasized, however, that while the company "encourages participation in civic affairs, it bends over backwards not to become too involved."

One Douglas supervisor nodded in understanding, nudged a friend beside him and commented that public relations personnel in the Douglas California plants undoubtedly would be interested in Dixon's pointers.

After the luncheon, the Douglas group toured the Midland plant—a sprawling industrial giant which takes in 1,000 acres, with another 2,000 acres surrounding and available for expansion. There are some 600 buildings, with 12,000 employment.

Products and components include Saran Wrap, Styron, aspirin, caustic soda, calcium chloride, and a multitude of other chemicals and plastics. In this instance, the Douglas men were complete strangers to the majority of the operations and came away with a renewed appreciation of the magnitude of American industrial know-how and endeavor. The production of Saran Wrap, a packaging material, for instance, is virtually a machine operation with men employed mainly as inspectors at strategic points.

"Man, is that a display of automation!" one Douglas foreman exclaimed. "Now I can really talk 'automation' with the folks in my department. All of us do a lot of talking about it, but this display shows what it really can do for industry." He scribbled notes which he would consult back in California as he told his departmental employees about automation as he had seen it in Michigan.

A Friday evening dinner sponsored by Dow featured as speaker W. R. Collings, vice president and general manager of the Dow Corning Co. Responding for Douglas were O. E. Bororff, assistant to the vice president in charge of engineering; Stanley B. Selling, national NMA director from Douglas Santa Monica, and C. L. Sullivan, president of the Douglas Long Beach Management Club.

Saturday was a day of relaxation for both the Dow and Douglas management groups, with attendance at the Big Ten Michigan-Illinois football game at Ann Arbor, Michigan.

"Pocketful of notes"

Seven a.m. Sunday, the Douglas voyagers boarded Donald Douglas' DC-3 for the 2,500 mi. flight back home. Though dog-tired, their enthusiasm over taking home new ideas for handling old problems was high. NMA director Selling patted his pocketful of notes. "I've got two ideas here," he grinned "that will make my department run a little smoother—maybe a whole lot."

"The greatest thing about the trip," chimed in a Douglas engineer, "is that meeting with other men in management, just like ourselves except for different jobs, makes you realize what a heck of a fine profession management really is. The specialization of management boils down to handling people and production, no matter what the company is producing."

So ended "Douglas-NMA Operation Management Unity," a great forward step in supervisory management personnel accepting—and successfully accomplishing—responsibilities traditionally those of executives.

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REVERE HOLLOW ALUMINUM EXTRUSION USED IN REVOLUTIONARY SUBMERSIBLE PUMP MOTOR FOR LELAND ELECTRIC COMPANY

The original design of this stator shell called for a casting but when the design engineers considered the factors that would be encountered, and the symmetry of shape, it became apparent that an aluminum extrusion might have many advantages over a casting.

At this stage Revere T.A. (Technical Advisory) Service, which in the past had proved helpful, was called in for collaboration and the advantages of extrusions vs. castings were discussed. By using extrusions there would be no problem of porosity which is often present in castings. Substantial savings in weight would be made and the only machining would be to the ribs on the inside of the tube. No machining of the outside of the tube would be required, which would be necessary should a casting be used, while the smoother surface on the inside would improve flow characteristics—an important factor in this particular pump motor as the fluid being pumped passes between the stator core and the extruded shell. With the smooth surface of an extrusion, less horsepower would be used to pump a given volume of fluid. The result was the Revere Aluminum Extrusion you see above.

This is still another example of Revere supplying the right metal in the right form to do the best job with the greatest economy . . . be it aluminum, copper or any one of their alloys. Why not consult Revere when you design?

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Western Industry

KNOW-HOW NOTEBOOK

. . . Part 1

selected production and maintenance ideas for Western plant operating executiv

Long-lasting insulation is important to this "in-the-yard" operation at Liquid Carbonic. Here's how it works: Natural gas is burned (1) and drawn out by blower (2) into scrubber (3) and on to absorption tower (4). Reboilers (5) raise solution temperature to 250-deg. F.

Top-notch insulation needed for extensive outdoor operation

Modern plant design technology used in the planning of Liquid Carbonic's, Oakland, Calif., completely automatic plant places about 80% of its production equipment in the open and exposed to the elements. Due to the nature of liquid carbon and dry ice production, this outdoor location of equipment posed an insulation problem.

Beyond the obvious savings achieved in having a plant building of relatively low square footage, being able to have its major equipment "in the yard" is important in this operation due to the size of the various items involved. The insulation problem lay in determining a method of protecting insulation on vital thermal units so that it would function with a minimum of downtime. And the fact that the automatic plant calls for only a two-man operating staff per eight-hour shift, a lack of personnel to handle emergency maintenance only added more problems.

Thermal insulation depends upon the small air spaces formed by the cells, flakes or spheres of solids in the insulation to retard transmission. Any heat passing through the insulation must be transmitted or conducted by the solid material, with resistance set up by the air spaces between the solid particles. When insulation becomes wet, or even partially wet, all or part of the small dead air spaces become filled with water and lose their insulating properties. Heat transmission through water-filled space will then be at approximately the rate of conductivity of water instead of that of air, or some 16 to 24 times greater than that experienced with dry insulation.

To meet specific requirements at Liquid Carbonic for maximum protection against the elements and to assure low maintenance costs, engineers selected a cold-applied asphaltic mixture called Laykold Weathercoat.

Supplied by the Oakland, Calif., office of American Bitumuls & Asphalt Co. and applied by Fiberglass Engineering and Supply Co. of San Francisco, the product played an important part in the speedy building of the plant. The asphaltic material is factory compounded with selected fillers to provide a single, thick application. Thus, in hard-to-reach places as the 70-ft. tower engineers were able to eliminate excessive labor costs involved in scaffolding and ladder-travel normally encountered in the placement of several coats.

Latest trend: push-button lube for lift trucks

Some interesting plant operating economies to be found in, and latest trends toward, push-button automatic centralized lubrication systems for industrial trucks were pointed out recently by L. C. Rotter, chief engineer for Lincoln Engineering Co. Available on new gasoline and electric-powered fork lift trucks and as an optional factory-branch installed accessory, automatic lubrication systems are now offered by six leading builders of shop and lift trucks.

Lubrication of these units by the

. . . for more details, adv. opp. pg., circle No. 31 on Reader Service Postcard ➡

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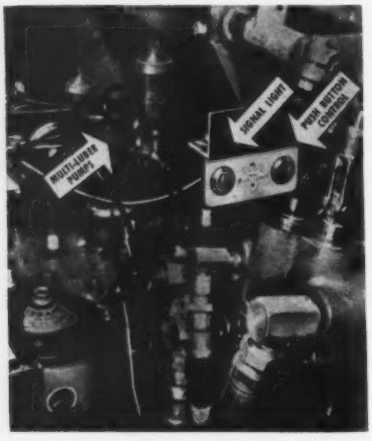
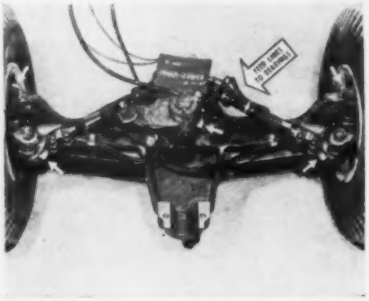
conventional grease gun method requires an average of 45 min. of a maintenance crew's time. A chain hoist or power lift has to be used, during which time the truck being lubricated is out of productive use. The time interval required is even longer for lubrication of electric motor-operated trucks because the batteries frequently have to be removed so that the maintenance man can crawl into this compartment to reach some of the grease fittings.

Mr. Rotter points out that a shop truck must be lubricated as often as once a day and at least every three days. Cost in man-hours, materials and down-time expended during a year, multiplied by the number of trucks employed, is quite a staggering sum. The advent of a thoroughly tested, high pressure automatic lubrication system that lubricates all bearings in two seconds with a mere press of a button once a day by the truck operator has saved thousands of plant operating dollars.



Main components of a centralized lubrication system are pictured above.

Operating characteristics of push-button lubrication systems are not complicated. Here, for an example, is how Lincoln's "Multi-Luber" system works: Power is derived from the engine intake manifold; pressing a control button on the vehicle panel actuates the system; two pumps mounted in the engine compartment, force the lube under high pressure through individual nylon feed lines to each bearing; the reservoirs of the two pumps hold enough lubricant to provide up to 175 cycles of the system without refilling; reservoirs are transparent providing easy lube level checks; reservoirs will not drain dry if a feed line is accidentally broken or disconnected, all other bearings will continue to be lubricated. In the case of electrically powered trucks, a manually actuated pumping unit is utilized. One push of the plunger rod cycles the system.



Individual lube feed lines serve the many lube points normally serviced by hand.

Users have reported that service-life of trucks has been extended by as much as 15 to 20% by use of the push-button lubrication. Mr. Rotter listed the following seven advantages of push-button lubrication.

1. Applies the right lubricant, in the right quantity, at the right time to all bearing points simultaneously while truck is in operation, which assures best results.

2. Delivers predetermined, measured shots of lubricant, under positive pressure, to meet the exact requirements of each bearing. No starving or over-lubrication.

3. Eliminates waste and mess . . . cuts lubricant consumption up to 50% or more.

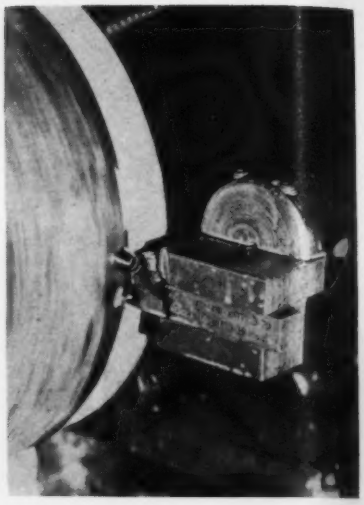
4. Saves man-hours . . . one man does a complete lubrication job at the push of a button.

5. Controlled lubricant application extends bearing-life up to 1500%.

6. Eliminates down-time for lubrication, and for repairs due to bearing failure or faulty operation of worn parts resulting from inadequate lubrication.

7. Eliminates personal injuries and corresponding compensation costs attributable to lubricant application.

GOT AN OVERHEAD HANDLING PROBLEM? WI's Know-How Notebook, Part 2, is designed this month to help you solve it. Over 50 of the most up-to-date technical manuals are reviewed concisely—and your selection is for the asking. Just use this month's Reader Service Postcard, page 69.



Turn-over button type inserts provide 16 cutting edges and then can be thrown out.

Throw-away inserts slash cutting tool costs

Tool cost in a tough turning job has been slashed from $1.20 per tool to $0.09 by replacing standard brazed tools with "throw-away" insert tools at Menasco Manufacturing Co., Burbank, Calif., manufacturer of aircraft landing gears. The turn-over button-type inserts provide four cutting edges on each side. After all eight cutting edges have been used, the insert is replaced at less cost than is required for regrinding a brazed tool of equivalent size.

Machining consists of rough and finish turning 11¾-in. diameter heat treated tank assemblies at 111 rpm., 320 sfm., and 0.017-in. feed with two cuts. Previously used tools required regrinding after rough and finish turning of each piece; only four regrinds per tool were obtained.

Now, using Kennametal's Kendex square "throw-away" indexable inserts, two pieces are rough and finish turned per cutting edge. Since this is a turn-over type insert providing a total of eight cutting edges, 16 assemblies are machined after which the insert is replaced eliminating all regrinding time and costs.

Despite the fact that there is an over-hang of the tool holder involved, no vibration or chatter is encountered. Ideal chip control is provided by a Kennametal chip breaker plate clamped on top of the insert.

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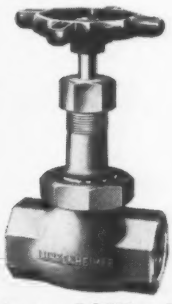

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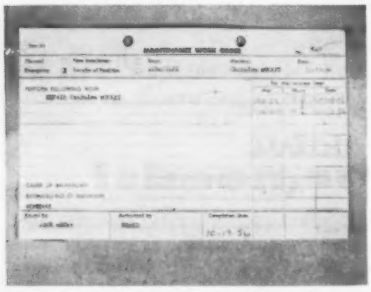
Look-ahead maintenance methods pay off for Northwest foundry

L. Wittmayer

Preventive maintenance—a factor in plant operation that has been overlooked in many Western plants due to press of production increases and facilities expansions—is of ever-increasing importance to Western plants today. Properly planned and implemented, scheduled down-time and look-ahead parts replacement are two big preventive maintenance factors that can achieve large-scale reductions. Here is a current example of how a new system can pay off, as related by Les Wittmayer, lead man in the maintenance department of Electric Steel Foundry Co.'s Portland, Ore., headquarters plant.—Ed.

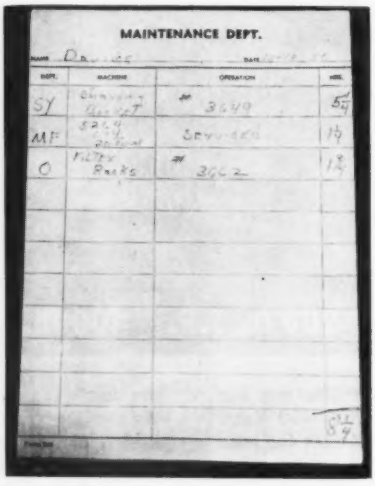
As in all industry, the trend in Western foundries is to automatic operations. We find more intricate designs in our new equipment. The failure of any part might stop long lines of other equipment dependent upon it. Production, delivery date, quality, and customer satisfaction cannot be obtained while machinery is down due to mechanical failure

To insure against loss of these important factors, we have initiated a preventive maintenance program. The program requires keeping of many records to determine the weak points in all of our equipment and to evaluate maintenance costs. The only way costs can be accurately determined is by means of maintenance work orders obtained from the foremen of the foundry's various departments.



Maintenance work orders enable the department to accumulate important cost data.

A routine inspection system has been established to prevent breakdowns during production hours. Machine inspections are made during its idle periods. A check is made for excessive wear on all moving parts and necessary replacements or adjustments are accomplished. From these inspections we also determine the life expectancy of various parts and can carry replacements on hand which might otherwise have to be ordered from some distant point, resulting in unnecesary down-time.



Daily performance cards provide more historical data on equipment serviced.

In addition to the work order, each man in our maintenance department fills out a card at the end of his shift indicating the work he performed during the day. The card shows the work order number, the machine, department, and time spent on the job. If a work order has not been issued, as in the case of an emergency, he gives details which will help complete the records. As can readily be seen, cooperation of the department heads in issuing work orders is important so that records will be accurate, inspection of equipment can be scheduled, and unnecessary breakdowns can be prevented. If it is known that a certain part will fail after a certain number of days operation, a replacement can be scheduled before it fails, and many hours of down-time can be saved.

Occasionally it is decided that maintenance man hours required for upkeep of a piece of equipment and cost of continually replacing parts justify scrapping the item and getting a replacement. However, without records of maintenance cost, such a decision could not be made. It is the maintenance man's responsibility to determine by inspection whether a wearing part will last until the next inspection period or to replace it. The following factors affect his decision:

1. How will a breakdown during production hours affect other production?
2. How long will the replacement take?
3. What is the cost of the part to be changed?
4. What will be the cost in lost production?

For an example, take the routine inspection of the electrode winch cables, on our P. T. furnace. Here, a worn or frayed cable means immediate replacement because a great deal of our production is geared to this furnace. A broken cable may take hours to fish through the mast and the many pulleys in the mast. By changing it before it breaks, only a short time is required to pull the new cable in while pulling the old one out. Cost of the cable is very small in relation to the lost production and possible damage if the electrode arm and holder should drop.

Welded pipe fittings provide high savings; strength increased

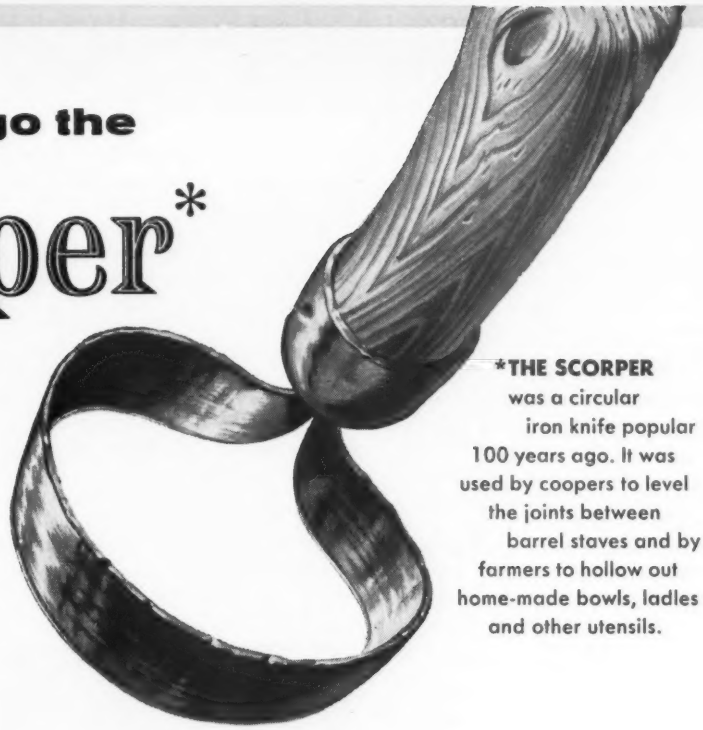
Some highly interesting points of in-plant economics were pointed out recently in regard to the trend toward welding small pipe lines rather than threading them for connection purposes. Having reference to pipe lines from ½ in. up, H. A. Sosnin, a practical welder directing an education program for Tube Turns Division of National Cylinder Gas Co., reports that savings are being realized from welding pipe fittings because of increased strength.

When threaded, half of the wall thickness is cut away. Thus, when using welding technique of joining

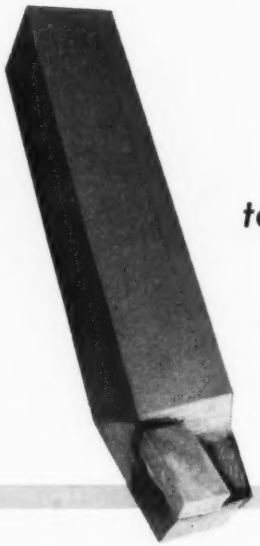
A century ago the

Scorper*

nibbled off wood shavings...



***THE SCORPER** was a circular iron knife popular 100 years ago. It was used by coopers to level the joints between barrel staves and by farmers to hollow out home-made bowls, ladles and other utensils.



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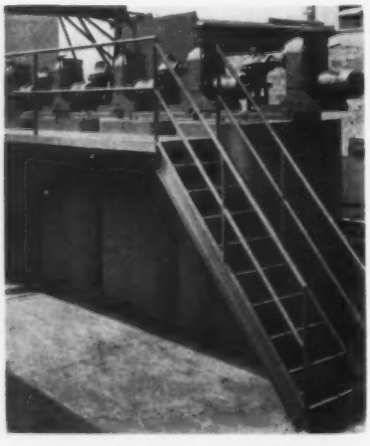
pipe lengths, a lighter schedule of pipe can often be specified than when thread joining methods are used. For example, Schedule 40 pipe joined by welding has more wall thickness—and a resulting increased wall strength—than Schedule 80 pipe joined by threading. Mr. Sosnin estimates that a Schedule 40 welded pipe installation should cost about 30% less than a Schedule 80 threaded installation. Added to these savings are advantages obtained from improved flow conditions, reductions in maintenance and reduced labor costs during pipe installation.

The following table is used by Mr. Sosnin to point up the time savings that can be achieved from welding fittings instead of threading them:

Nominal Pipe Size	Thread & Fit	Weld
2½"	15 min.	10 min.
2"	10 "	8 "
1½"	8 "	7 "
1¼"	6 "	6 "
1"	5 "	5 "
¾"	5 "	5 "
½"	4 "	4 "



Paint quality has been boosted at this Western paint plant since installation of variable speed drives on mixing set-up.

Variable speed drives boost paint mixing efficiency

Slower mixing speeds needed for more effective paint mixing at General Paint Co. in Los Angeles have been gained through installation of five variable speed drives. Important to paint quality, this job is done in five specially constructed tanks.

Each tank has a capacity of 6,300 gal. Powerful impellers, rotating at from 30 to 100 rpm., perform the mixing action. Each is driven by a U. S. Electric 7½-hp. Varidrive-Syncrogear equipped with explosion-proof motors.

The tanks were designed and constructed by the Mooney Machine Manufacturing Co. of Maywood, Calif. Actual speed rates of the drives are 520 to 173 rpm. The impellers are driven through right angle gear reducers to gain the slower mixing speeds needed.

New "Klimp" saves packaging time on both ends of the line and can be reused.

New clamp: reusable, stronger, provides faster application

A new clamp—the Klimp—providing 30 times the holding power of a nail may well effect a savings of millions of dollars per year in shipping costs for private industry and the U. S. Air Force. Invented by North American Aviation packaging engineer Kenneth G. Highley, the Klimp is a reusable L-shaped clamp of spring steel designed to fasten together cleated panel boxes.

Because the Klimp does not damage the panels, containers may be used many times over. As little as half the time is required to apply Klimps to a box as is required for nailing cleated panel boxes closed. North American experts estimate that, when "Klimped," boxes can be opened in less than one-fifth the time required to open them with a nail puller.

Engineers at this Western aircraft plant have also invented a simple hand tool for tapping the Klimps on and for removing them. Similar to a hammer, the tool is comprised of a weighted head for the tapping-on action and a curved claw for the removing action.

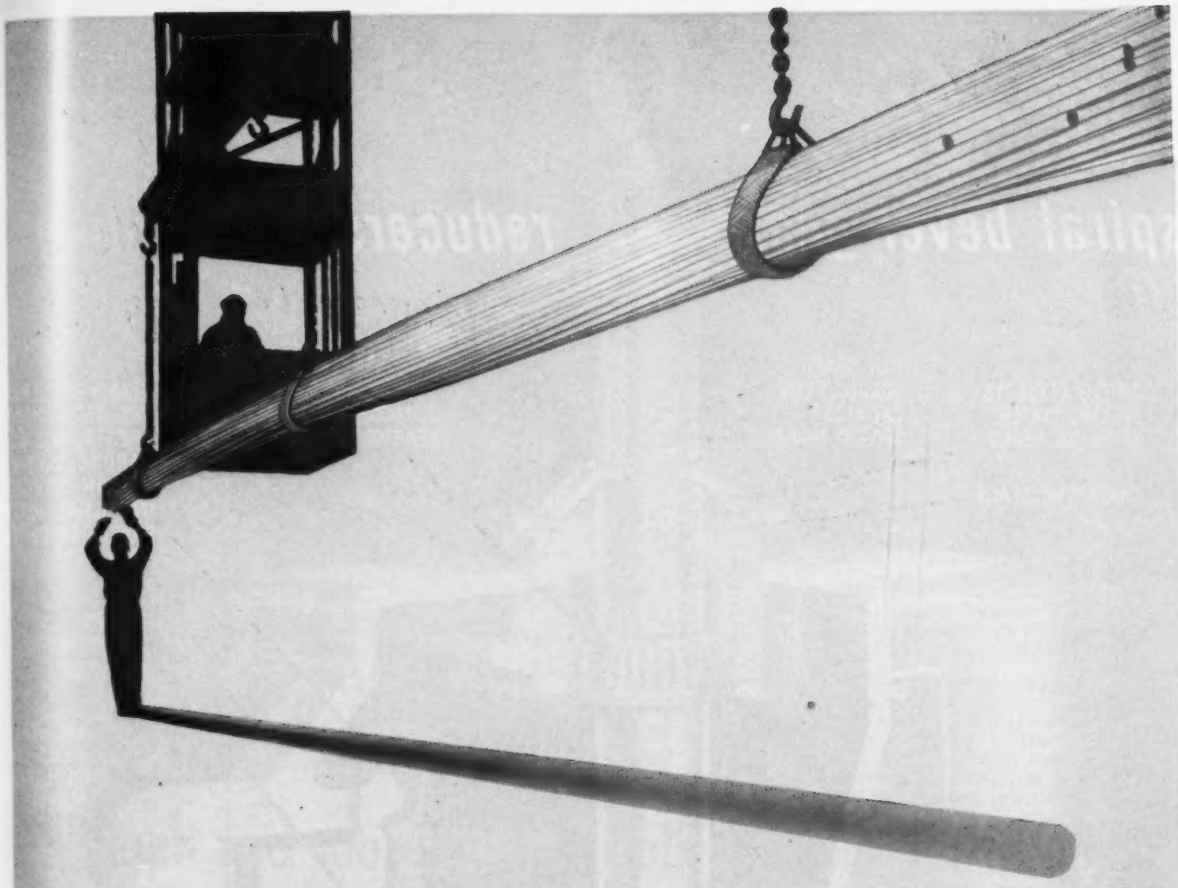
North American holds trademark rights on the item and has applied for a patent. The Holister Coil Spring Manufacturing Co. has been licensed to manufacture and distribute the device.

New abrasive flooring plate has greatly increased the safety factor of this operation.

Abrasive plate flooring puts the brakes on accidents

Pea waste on a sloping floor can make personnel and equipment movement a precarious venture, but Libby, McNeill & Libby's plant in Walla Walla, Wash., has recently completed a season of working on floors subjected to those conditions without a mishap.

When a concrete mezzanine needed replacing at the plant prior to the 1956 packing season, engineers at the plant decided to install an Alan Wood Algrip steel floor. The mezzanine is 12' x 72' in size and is used for storage hoppers above the fillers. So that good drainage could be obtained the floor was installed at a 5 degree slope. All joints of the Algrip plate were



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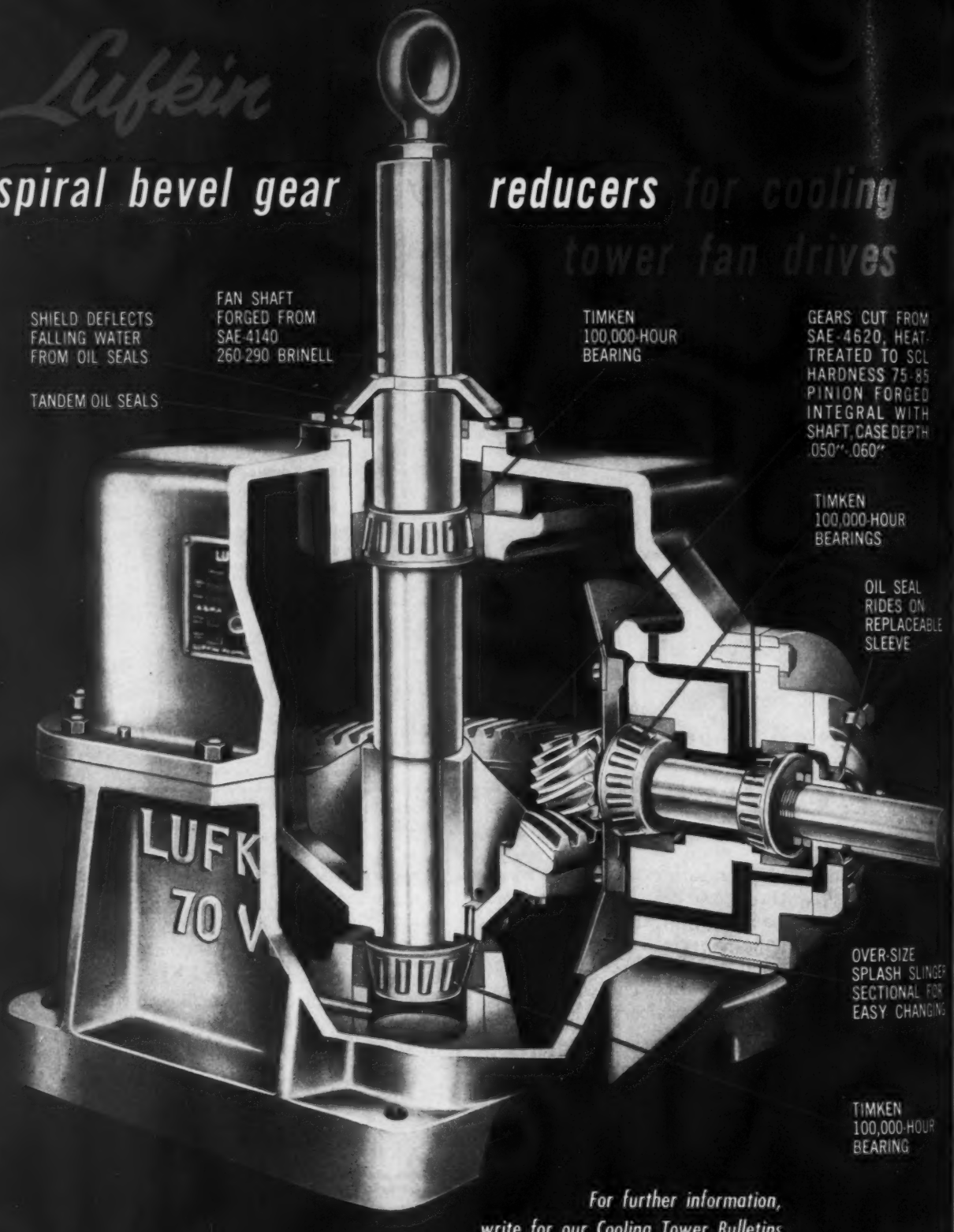
Lufkin spiral bevel gear reducers for cooling tower fan drives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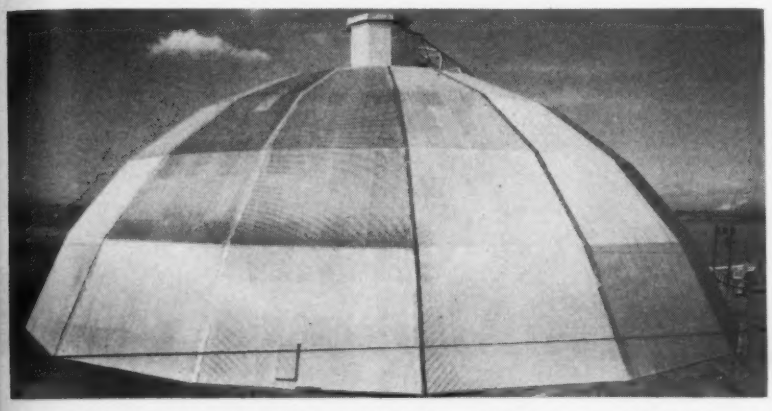
welded to make the floor leak-proof, thus protecting workers and equipment below from drippage.

The plate used for the floor is an abrasive rolled steel product in which grinding-wheel type materials have been rolled as an integral part of the upper portion of the steel floor plate.



A savings of 50% in labor and elimination of scaffolding needed for erection of Kaiser Gypsum's corrugated aluminum, dome-shaped storage structures was obtained due to simple fastening method involving end-welded composite aluminum Rivweld studs.

Stronger and more stable bulk storage units from aluminum

By designing two giant storage buildings in a dome shape, Kaiser Gypsum has obtained a storage structure with greater stability than conventional construction would provide and one which will withstand wind and earthquate shocks better. Furthermore, the dome shape conforms closely to the general shape of the loosely piled gypsum, thus providing maximum use of available space.

Attractive and economical corrugated aluminum roofing sheet was used to cover the structure. Each storage building rises 70 ft. and spans 175 ft. at the spring line. Each unit has a storage capacity of 35,000 tons of gypsum rock.

Designed by Kaiser Engineers, the structural system of the two units consists of radial beams, circular rings and diagonal bracing. All bracing and ring connections were welded.

Corrugated aluminum industrial roofing sheets, supplied by Kaiser Aluminum & Chemical Corp. and installed by Mitchell Steel, Inc., of Torrance, Calif., were fastened to the structural members by end-welded composite aluminum Rivweld studs. It is estimated that this simple and effective method of fastening produced a saving of 50% in labor costs and eliminated the need for interior scaffolding.

A power brake using a special die was used to preform the transverse bending of the aluminum sheets to conform with the changes of dome contour.

New compressor cuts chance of mold collapse, and cost

Installation of a new air compressor at its Emeryville, Calif., plant has doubled Forni Co.'s available cfm. rating and has permitted installation of automatic air-powered shakers and vibrators for tamping sand into molds.

Thus, Forni—manufacturer of concrete water meter boxes—has mini-

← . . . *for more details, adv. opp. pg., circle No. 35 on Reader Service Postcard*

GEARS FOR INDUSTRY
THE Lufkin LINE
OIL FIELD PUMPING UNITS

SC's STUDENT OILMEN

V. J. Fawcett

On the mornings of January 7th and January 9th at The University of Southern California, it was a real privilege to return to the "SC" campus as one of Professor Nick van Wingen's guest lecturers to the senior class on petroleum engineering.

Nick van Wingen is one of California's best known consulting petroleum engineers and one of the industry's most popular guys.

Can't help thinking how fortunate these SC engineering students are to be getting the best possible theoretical training in the petroleum field, combined with the added effectiveness of receiving instruction from a seasoned, practicing professional petroleum engineering consultant.

Specialists in the fields of pumping units, gears, rods, pumps, engines, technical services and their part in the oil industry are presented from time to time to bring to the petroleum engineering students the latest practical application of these products or services.

Lufkin is always glad to share its experience with engineering students everywhere. Several times each year, groups of students are taken on conducted tours through the factory at Lufkin, Texas.

To Professor N. van Wingen's students we wish every success in the years ahead, and—may I remind my fellow Trojans—at Lufkin the welcome mat is always out!

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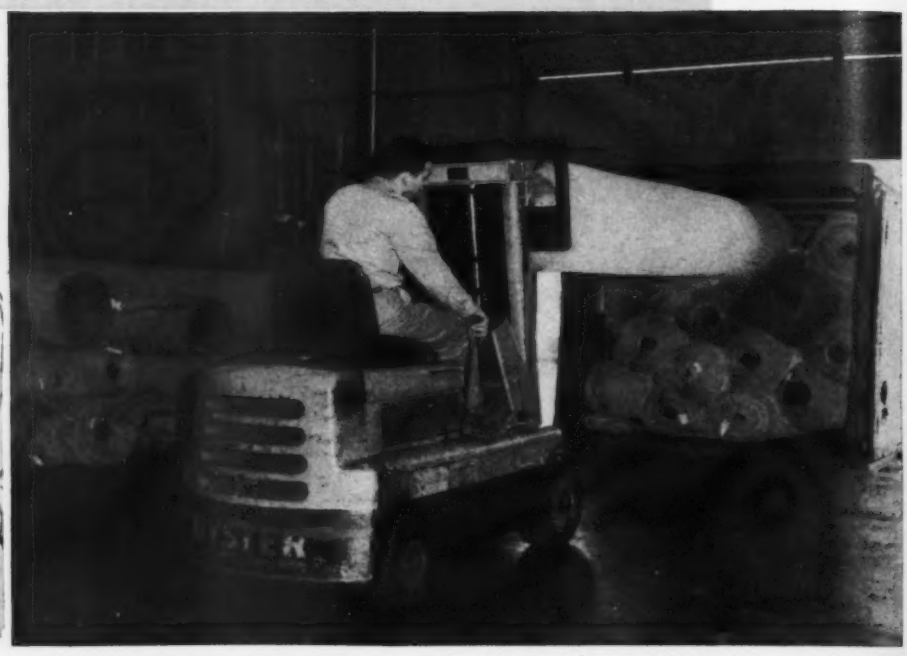

Rug pole equipped Spacesaver 40 loading out carpets. This unit will handle the heaviest rolls now being processed at this finishing mill.

Pictured above is one of many typical examples of how Hyster® Industrial Trucks are helping to effect tremendous savings in the cost of handling materials in the Textile Industry.

Even if you are now using lift trucks or have never used industrial trucks of any kind, your Hyster dealer can show you how you can quickly realize more profit from your operation with these multi-purpose utility tools. Your Hyster dealer knows materials handling . . . he is an expert on the problems and their solution. He can help you with special techniques and cost reducing methods. Call him today...why not take advantage of his materials handling know-how? He is listed under "Trucks-Industrial" in your telephone directory.

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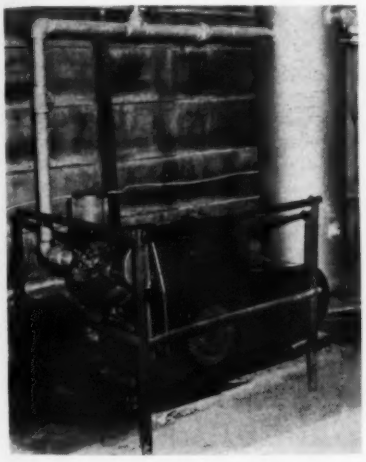
KNOW-HOW NOTEBOOK

Part 1, continued

mized possibilities of mold collapses and cut the cost of its operation.

Prior to gaining the extra air power needed to operate the mechanized tamping equipment, Forni mold sand was hand-tamped—a time consuming method. Capital investment involved in changing compressors was relatively small when compared to the gained product quality assurance and reduced manpower required.



Air vibrators, grinders, bench rammers, and other foundry equipment are powered by 105 cfm. of air provided from new compressor.

Forni's new compressor is an Atlas Copco unit. Installed by the compressor division of Atlas Copco Pacific of San Carlos, Calif., the compressor is actually a Swedish-made unit. A two-stage 25-hp. model, it delivers 105 cfm. for operation of air vibrators, grinders, bench rammers, jolt squeeze machines, a sander, a centrifugal casting machine and an automatic molding-stacking-conveying unit.

New arc welding equipment reduces job labor costs

Arc welding operations have been speeded up with resultant labor cost savings at the Pacific Coast Engineering Co., Alameda, Calif., through recent changes in equipment used. Arc welding is used on a large scale by this

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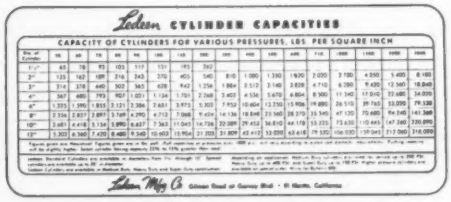
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Semi-automatic and fully automatic arc welding equipment investment has speeded this plant's operations, saving labor dollars.

fabrication firm in the production of heavy equipment for hydo-electric and steam power plants, including all types of cranes, dam gates, hoists, cable drums, etc. The plant handles the job from design to delivery.

Recent changes in equipment include application of semi-automatic and fully-automatic submerged arc welding, use of iron powder type electrodes and combination a-c/d-c machines from manual welding, both indoors and outdoors.

Among the equipment used are five Lincoln Electric manual Lincolnweld "Squirt" welders for semi-automatic submerged arc welding. These are used principally on long-run butt welds in barge plate, the welding guns being mounted on burning carriages, set up as small portable automatics. They are also used manually for heavy multiple pass welds or where carriage mounting is not practical. Two of the guns have been mounted on manipulators for jobs which the full automatic welders cannot reach.

New truck trailer used by Owens-Illinois carries 1,000 five-gallon glass containers each trip.

Big aluminum bed truck trailers cut costs and boost service

Purchase of eleven truck trailers in four different sizes has permitted Owens-Illinois Glass Co. to cut delivery costs at its Los Angeles glass container plant. By having quantities of four different size trailers—four 40-ft., three 35-ft., two 26-ft., and two 21-ft.—the plant has obtained a service flexibility that permits full utilization of equipment.

An added cost reducing factor in this Southern California delivery operation is the fact that the eleven trailers each have aluminum beds. Small particles of glass common to the operation do not tear up these beds like they do wooden models. Also, the aluminum beds save up to 1,000 lb. in over-all weight on a 40-ft. trailer.

The trailers—all of which are Fruehauf units—are equipped with automatic supports. Often used on a shuttle basis, the trailers' automatic supports save valuable time, particularly when they are left at the customer's place of business for unloading. The supports also eliminate danger of dropping the front of the trailer when tractors are disengaged.

Latest addition to the Owens-Illinois trailer fleet are the 40-ft. units. These carry 1,000 five-gallon glass containers. The popular six-ounce bottle used so much by soft drink beverage producers are handled 12 gross on each 45 x 60-in. pallet, of which the 40-ft. trailers can take 16.

A set of Fruehauf doubles—one 21-ft. and one 26-ft. trailer in train—carries 18 pallets while the 35-ft. models carry 14 pallets. A four-way pallet is used so that the trailers can be unloaded from either side or back.

Hill-top tanks provide gravity flow of oil at refinery

Taking advantage of natural elevation at its Edmonds, Wash., refinery, Union Oil Co. of California located two 80,000-bbl. Chicago Bridge & Iron tanks with Horton Double-Deck floating roofs on a hill. Crude oil stored in the tanks flows via gravity to asphalt stills at a pressure of 30-40 psi.

Charles Hanson, Bottling Superintendent, Hudepohl Brewing Co., Cincinnati, Ohio

Bottling Superintendent points out the many advantages of UNOBA grease

"Admittedly, we were skeptical of the claims made for Union's Unoba grease, particularly that Unoba would not wash out of the conveyor chain bearings in our Meyer Pasteurizing machines.

"As anyone in the business knows, these bearings are constantly subjected to steam, boiling water and subsequent corrosion in operation. However, the heat and water-resistant properties of Unoba F-2 have proved more than equal to standing up under these severe conditions, and we no longer have the "caking up" of grease common to those bearings subjected to heat.

"Previously we had noticed a film of grease accumulating on our water screens, but since using Unoba they remain perfectly clean. Also, Unoba has enabled us to cut down on the frequency of lubrication. Where we had been in the practice of greasing once a week we now lubricate only once every 20 days, operating two shifts.

"It's certainly a relief to know our lubrication problems have been solved and that we've found a grease that's cutting our costs way down."

Hudepohl uses Unoba F-2 in their Continental Can Seamer equipment as well as in the Meyer Pasteurizer, and Unoba F-1 in all high-speed bearings, bottle soakers, bottle and conveyor lines and labeling machines because they've found Unoba greases are the solution to lubrication problems common to every brewery. If you haven't tried Union's barium-lithium base Unoba grease we suggest you do. Unoba is immediately available from your nearby Union Oil Company representative.

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Western Industry

KNOW-HOW NOTEBOOK

50 BEST MANUALS ON OVERHEAD HANDLING

—yours for the asking

HOW-TO-DO-IT MANUALS reviewed on the following pages (66-76) constitute a handy self-service library of the most up-to-date information available on just one class of plant operating equipment—cranes, hoists and their accessory items. Included are concise reviews of important guides to selection, operation and maintenance of today's many different types of overhead handling equipment.

During the past three months, these manuals have been collected by the editors of WESTERN INDUSTRY to bring this library to life. By special permission of the manufacturers who published them, key production and plant operating men in Western plants are welcome to their selection free.

You are invited to check the listings and select those manuals that promise to be most helpful with your overhead materials handling problems. Circle appropriate key numbers on this month's WI Reader Service Postcard (page 69) and we will be glad to see that you obtain your choices promptly. We do request that you be selective, and not ask for all manuals.

54-p. manual on systems analysis, selection

Chapter heads like "Why Mechanical Materials Handling" and "Your Handling Problem" characterize this treatise of 54 pages. Discussions of materials handling as related to mechanical equipment, specific types of systems, analysis for selection and fundamental handling processes for industry are given with illustrations of monorails and crane equipment. *The Louden Machinery Co.*

. . . for your copy, circle No. 251

How an automatic dispatch system works

How products can be automatically carried through your plant—with production, storage, finishing and shipping steps outlined—is explained in this manual giving outstanding advantages, detailed system layouts, and data on component parts. (Twin-Trak Catalog) *Richards-Wilcox Mfg. Co.*

. . . for your copy, circle No. 252

The inside story of hoist mechanism

Actual cut-outs of components parts on successive pages of this catalog fit together to make an unusually realistic picture of a hoist mechanism. Twelve design features of the Cable King wire rope electric hoist are pointed out in this layered fashion. Equally graphic are the case history pictures, charts, and other illustrations in its 16 pages. *Yale & Towne Mfg. Co.*

. . . for your copy, circle No. 253

Engineering data on Tramrail line

A list of 15 jobs Tramrail systems can do for you opens this 10-page informative booklet that covers rail and arch beams; ball and socket method of track support; carriers for electric and hand operation; motor tractors; switches, cranes, collectors, buckets and grabs. Well-illustrated with photos and drawings, stress table and comparison chart. *Cleveland Crane & Engineering Co.*

. . . for your copy, cicle No. 254

Case histories of overhead trolley conveyors

Case histories showing synchronized operation with trolley conveying systems bring out essential information in this stiff-cover, 30-page manual. Outstanding features are spotlighted in two pages about the light-weight, easily-installed Trol-e-Veyer, and other sections contain blueprints, photos, charts and pertinent selection facts on various conveyor units and components. *The Alvey-Ferguson Co.*

. . . for your copy, circle No. 255

How to select an overhead traveling crane

Material on rating, capacities, dimensions and clearances is given in "How to Select an Overhead Traveling Crane," which divides crane service into four duty classifications. Other features are a table of recommended speeds for hoist, trolley and bridge travel; data on lubrication, erection, gear drives, etc.; a sample form for requesting crane information, and a page of sample specifications. *Whiting Corp.*

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24-p. manual on many load handling products

Selection and ordering information on a variety of load-handling equipment is contained in this 24-page manual. Gives particulars on Budgit portable electric hoists, chain block, crane assemblies, cord reels, bridge drives, gantry frames; Load-lifter wire rope electric hoists up to 20-ton capacity and several hand and electrically operated cranes; Tugit lever-operated hoists for lifting and pulling; Tipit load slings for tipping loads, and attachments for many of these. *Shaw Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc.*

. . . for your copy, circle No. 257

"10 Things Hired Hands Can't Do"

. . . describes that many ways in which lightweight overhead conveyors can cut costs and improve production processes. The eight-page bulletin includes complete specifications and many pictures. *Jervis B. Webb Co. of Calif.*

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Bulletins about air hoists, cylinders, valves

Comprehensive engineering data on air hoists, cylinders and valves are given in these two bulletins with code word charts, dimension drawings, descriptions of parts, and pictures. *Curtis Manufacturing Co.*

. . . for your copy, circle No. 259

8-page fact folder on air hoists

This factual bulletin takes the reader inside an air hoist to see what makes it tick, bringing out pertinent details with cutaway photos, action pictures, spec charts and condensed descriptions. Design advantages are listed for the lightweight hoists, 150-lb. to 1-ton capacity, and for accessories such as trolleys, baskets, etc. Also available are several application case histories, sales and engineering data sheets. *Gardner-Denver Co., Keller Tool Div.*

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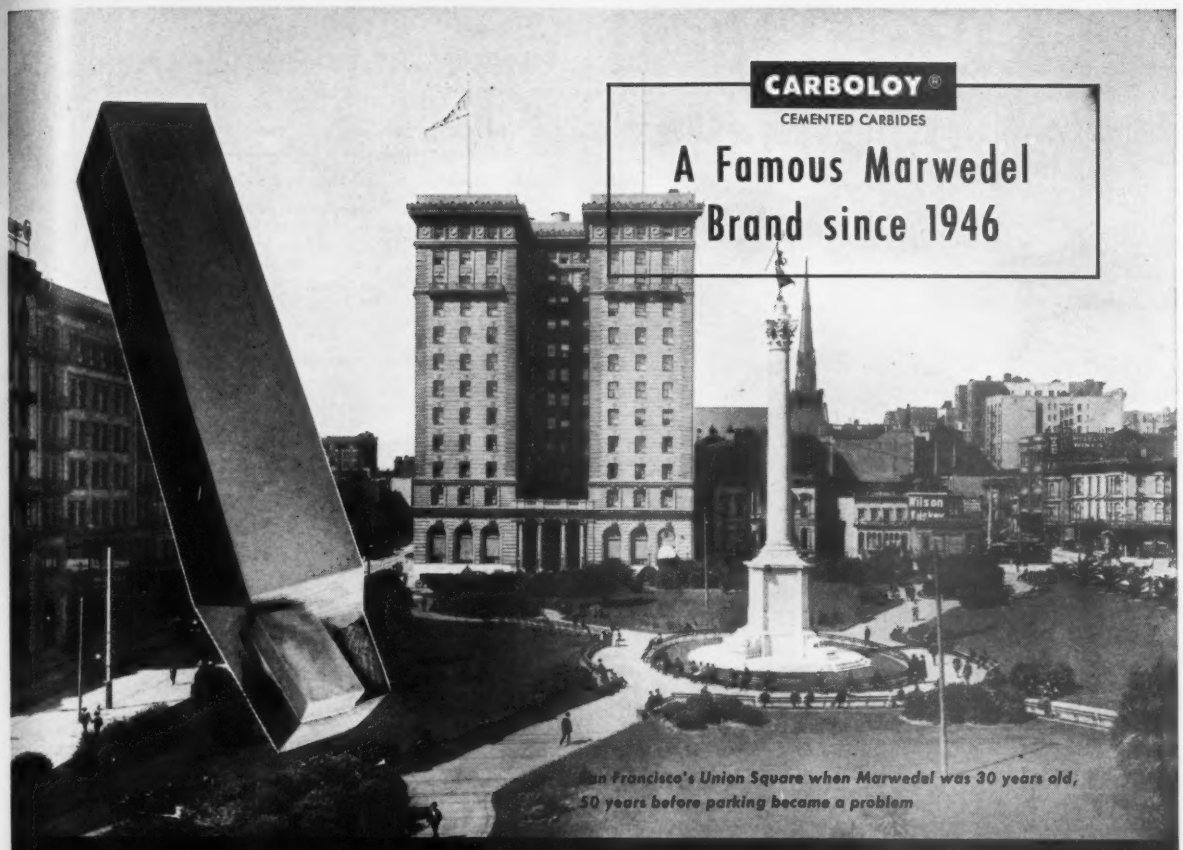
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KNOW-HOW NOTEBOOK . . Part 2

50 BEST OVERHEAD HANDLING MANUALS . . . continued

Automatic selective delivery with trolley conveyors

An article reprint explains an unusual flexible handling system for bulky, fragile loads at an electronics plant, giving details on how the specific trolley conveyor system works. Also available is an open-out folder "Tops in Trolleys" with a graphic comparison chart showing loads in pounds and deflection in thousandths of an inch. *Mechanical Handling Systems Inc.*

. . . for your copy, circle No. 261

12-p. fact book on electric chain hoists

Bulletin 158 gives 12 pages of facts on the Lodestar electric chain hoist listing various available capacities (⅛ to 1 ton) and speeds, prices and design features. Pictures and detailed descriptions of interchangeable suspensions help you select most appropriate model. *Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.*

. . . for your copy, circle No. 262

Monograph on monorail systems

A six-point explanation of industrial monorail track opens this 8-page pamphlet full of pictures of monorail installations including items such as clips, clamps, brackets, joints, rods, turntables and switches, as well as accessories like sheet lifters, lift conductor wire and bars, barrel grabs, plate grabs and trolleys. *Industrial Crane & Hoist Corp.* . . . for your copy, circle No. 263

36-p. data book on air hoists, accessories

Air hoists, ½ and 1-ton capacity, with pull cable or lever pendent control, are included in this 36-page manual. Spec charts and ordering data for the hoists plus accessories like baskets, hook assemblies, trolleys and trolley adapters. *Aro Equipment Corp.*

. . . for your copy, circle No. 264

Folder details self-supporting jib cranes

Base or pillar mounted self-supporting jib cranes are treated in this folder with action photos and closeups of hoists and an optional power-rotation mechanism. Design advantages, typical uses and spec data are included. *R. G. LeTourneau, Inc.*

. . . for your copy, circle No. 265

144 answers to your hoisting problems

. . . are given in this catalog showing how the unit construction plan combining four main units and the hook and block assembly sub-unit can produce 144 different hoists. Typical drawings of combinations, dimensions, photos and charts furnish further hoist know-how. *Reading Crane & Hoist Corp.*

. . . for your copy, circle No. 266

Manual on 80 crane, derrick and hoist products

Eighty cranes, derricks and hoists, attachments and accessories for them are detailed in this catalog with photos and fact-filled paragraphs about each. Included are 12 types of cranes, two derricks and two hoists. Some accessories listed are wheels, sheaves, clamps, grips, tongs, hooks, blocks, slings, cradles and lifters. *Downs Crane & Hoist Co.*

. . . for your copy, circle No. 267

Case histories of unloaders

Five picture case histories of Clyde unloaders in action illustrate uses and advantages, particularly the line's Fleet Block reeving. Diagrams and dimensions are given for the unloaders with descriptive text and photos of controls, A-frames, booms, hoists, etc. *Clyde Iron Works, Inc.* . . . for your copy, circle No. 268

Where to use an air hoist

This article reprint deals with safety factors surrounding the use of the power hoist and lists five special problems in efficient use of power to move a load. How air hoists are efficacious in such situations is explored, with application pictures to help tell the story. (Form 5190) *Ingersoll-Rand Co.*

. . . for your copy, circle No. 269

Detailed data on coil-chain hoists

A cutaway drawing pointing out 10 design details is featured in this 6-page open-out folder about electric coil-chain hoists. It has complete specifications, descriptions and dimensions. *Coffing Hoist Div., Duff-Norton Co.* . . . for your copy, circle No. 270

SIMPLIFYING HEAT EXCHANGER AND CONDENSER FABRICATION

The ease with which heat exchanger and condenser tubes can be rolled into tube sheets depends, to a certain extent, upon the uniformity of tube wall. One of the controlling factors of wall uniformity in the manufacture of seamless steel tubing is the contour of the piercer point.

Phil Morrison, a piercer point man, is shown at work on one of B&W's seamless tube mills. One of his duties is to examine the piercer point between each tube making operation. By making certain that the point has not been deformed in service—and that takes experience and a practiced eye—he helps to control wall uniformity in the pierced tube. He knows that although hot and cold work after the piercing operation can minimize, it cannot eliminate non-uniformity of wall section.

Phil's attention to detail, teamed with specially designed piercing equipment, helps to achieve the quality—"ease of rolling-in"—for B&W Heat Exchanger and Condenser Tubes. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

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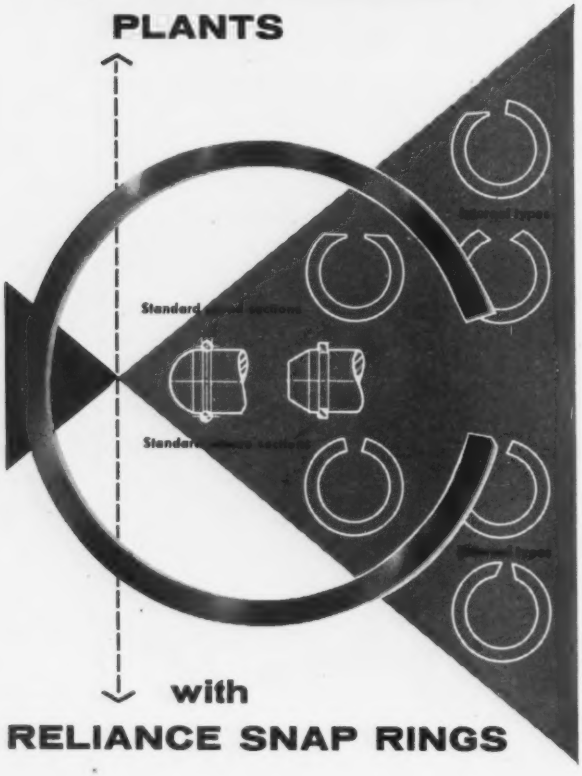

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KNOW-HOW NOTEBOOK . . Part 2

50 BEST OVERHEAD HANDLING MANUALS . . . continued

Spec sheets on hand-traveling cranes

Spec sheets, punched for notebook insertions, give necessary facts on hand-traveling cranes of three types—top running single bridge, underhung single bridge, and top running double bridge. Each 4-page bulletin gives capacity, span, weight and other data with drawings, and has a separate sheet describing the classes of end trucks for use with the cranes. *Wright Hoist Div., American Chain & Cable Co.* . . . for your copy, circle No. 271

Data on hoists of 250 to 40,000-lb. capacity

Cutaway photographs of the Hevi-Lift (1,000 to 40,000 lb.) and Zip-Lift (250 to 2,000 lb.) hoist lines are a feature of this bulletin which has condensed specifications for the two types. Details are given for the dust-proof control cabinet, permitting easy visual inspection, and the RCD brake with selenium rectifier. *Harnischfeger Corp.* . . . for your copy, circle No. 272

30-p. spiral manual on industrial cranes

In the 17 sections index-listed in this 30-page spiral bound catalog you get complete information on such items as box and I-beam girders; bridge trucks, parts and drives; trolleys, trolley frames and parts; hoist gears and cases, and crane controls, speeds and clearances. Several pages are devoted to cranes in use; job-engineering; spec charts, and blueprints. *Ederer Engineering Co.* . . . for your copy, circle No. 273

12-p. guide to hoisting equipment selection

Over a dozen types of hoists are detailed in this 12-page catalog with specifications, pictures and prices. Models covered include spur gear, screw, "Mighty-Mite" trolley, army type and low headroom trolleys, extended handwheel, twin hook, and clevis connected hoist and trolley. Also discussed are Philadelphia plain trolleys, the economy style in that series, and a push-type crane assembly. *Philadelphia Chain Block & Mfg. Co.*
. . . for your copy, circle No. 274

Open-out folders on bridge cranes

Two open-out folders, each with 21 pictures, bring out salient facts about bridge cranes in two classes—floor or cab control double girders with Shepard type trolleys, and welded plate girders with Niles type trolleys. The first presentation, on cranes of 5 to 350-ton capacity, concerns grab bucket, gantry, wall and jib types; the second deals with 1 to 20-ton units and includes close-ups of design features. *Shepard Niles Crane & Hoist Corp.*
. . . for your copy, circle No. 275

Manual of worm-drive electric hoists

Twenty features of Electrolift worm-drive hoists are pointed out in this bulletin covering monorail hoists of various types: hatchway, twin hatchway, rope guide, two-speed a-c hoists, current conductors, and collectors. *Electro Lift, Inc.*
. . . for your copy, circle No. 276

Spec sheet on Skagit gantry crane

Figures on sizes, fabrication, cab and leg wheels and other vital data fill this spec sheet on gantry cranes, with a typical installation pictured and design features explained. *Skagit Steel & Iron Works* . . . for your copy, circle No. 277

Picture brochure on cranes

Six pages of this brochure list 1 to 225-ton capacity cranes installed during last several years by the firm, including many for government projects, industrial and municipal purposes, as well as general industrial jobs. Phtographs of 16 installations show cranes furnished for dams, bridges, factories, etc., and also illustrate an article, "Story of a Crane." *Cyclops Iron Works*
. . . for your copy, circle No. 278

Conco bulletin on cranes and hoists

This 8-page bulletin describes in text and pictures materials handling equipment such as hand-powered and electric overhead traveling cranes, single I-beam electric crane bridges, trolley hoists, and various crane assembly components and attachments. *Conco Engineering Works* . . . for your copy, circle No. 279

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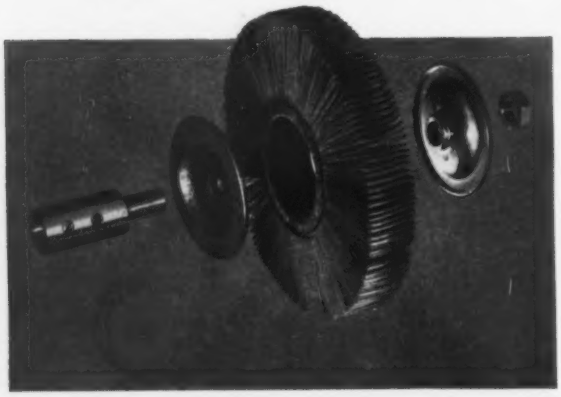

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KNOW-HOW NOTEBOOK . . . Part 2

50 BEST OVERHEAD HANDLING MANUALS . . . continued

30-page book on handling bulk materials

Design, production and installation of equipment for handling bulk material are thoroughly discussed in 30 pages about ore and coal bridges, man trolley unloaders, replacement trolleys, rope-operated towers, hydraulic buffers and rail clamps. Many picture case histories serve to show typical uses, as do blueprints of bridges. *Dravo Corp.* . . . **for your copy, circle No. 280**

Data sheets on 3-way loader and 2-way utility hoist

Two data sheets cover the "3-in-1" lift and the utility hoist which changes from shop hoist to truck hoist in seconds. The triple machine, a combination loader, shop boom and fork truck, is described and illustrated, with design features and specifications included. Several uses are shown in the utility hoist bulletin which has specification drawings as well. *Unit Manufacturing Co.* . . . **for your copy, circle No. 281**

Tips on tramrails

Comprehensive data on tramrail systems with details such as Teerails and Beamrails getting special attention is given in this manual of 8 pages. Numerous design advantages of parts and systems are listed. Drawings and application pictures. *The Forker Corp.* . . . **for your copy, circle No. 282**

Lumber grapple data sheet

Quotation data, dimension drawings and operation photos are given in this 4-page data sheet on Brute hand or electric grapples. A full-page photo of the Series 100 model has 17 design features pointed out and labeled. *Star Iron & Steel Co.* . . . **for your copy, circle No. 283**

4-page bridge crane bulletin

Diesel and electric bridge cranes, automatic and spreader-bar air tongs are discussed in this 4-page bulletin, with descriptive paragraphs and seven application photos showing unloading, logging and bridge installations. *Berger Engineering Co.* . . . **for your copy, circle No. 284**

Uses for motor-driven trolley hoists

Eight illustrated applications for motor-driven trolleys open this 12-page catalog about hoists and trolleys, which has a 3-page specification chart, several drawings and pictures. *Robbins & Myers* . . . **for your copy, circle No. 285**

Blueprint, specs and prices on wire rope hoists

A center spead blueprint of the Meteor wire rope electric hoist is a feature of this 24-page Bulletin 142-F that describes various capacities (½ to 5 ton) and speeds available in the line which is thoroughly detailed in a six-page section. Data on various types of trolleys, controls, accessories and important features are given, plus three price list sheets. *Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.* . . . **for your copy, circle No. 286**

Continuous power conveyors; track equipment

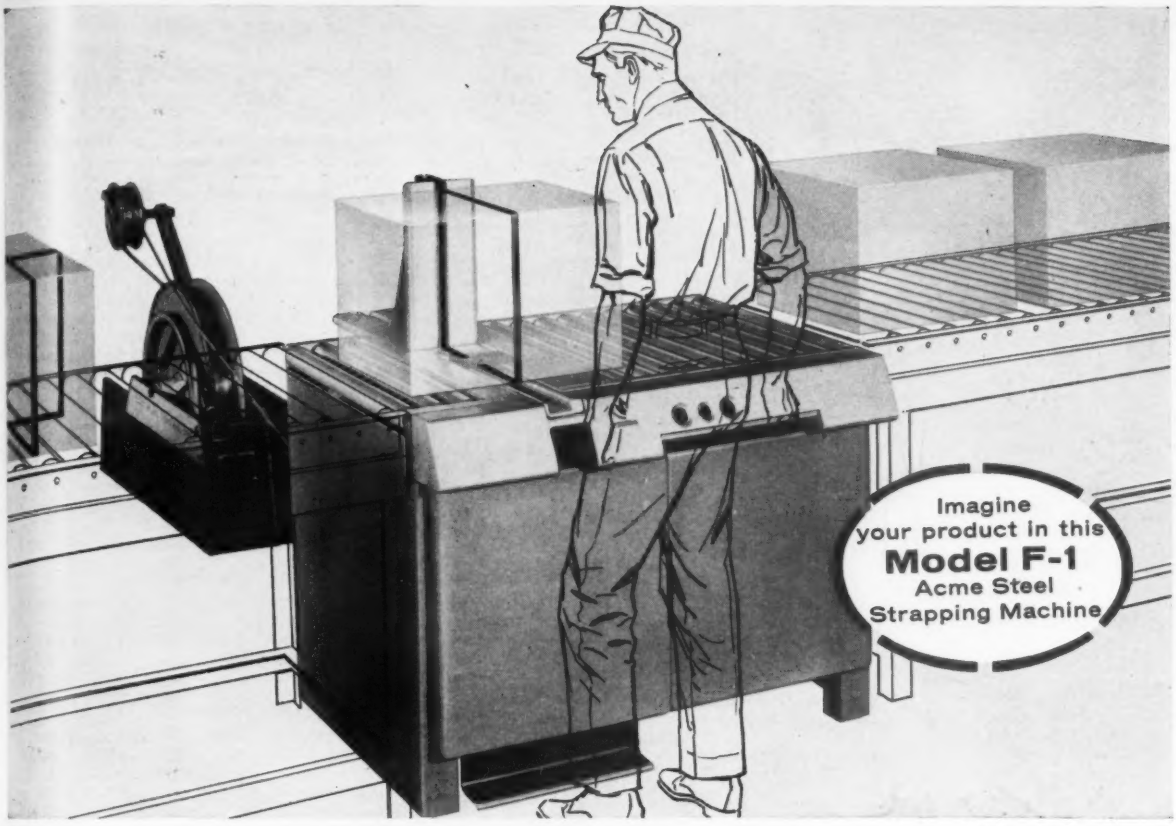
This manual presents complete information on Zig-Zag continuous power conveyor systems as well as Safe-Rail track equipment. Contains installation information, photographs, dimensions, etc. (Catalog No. A-93-R) *Richards-Wilcox Mfg. Co.* . . . **for your copy, circle No. 287**

Manual about hand-powered traveling cranes

A general description of one line of cranes and service opens this catalog giving ordering information, descriptive paragraphs and pictures of all models, data charts and specifications, plus a complete listing of chain and electric hoists, monorail runway systems, traveling cranes and trolleys. *Reading Crane & Hoist Corp.* . . . **for your copy, circle No. 288**

30-page manual on the Junior Monoveyor

A 30-page presentation on an overhead monorail conveyor system covering all standard Junior Monoveyor components. It gives reference data on trolleys and chain, tracks, corner turns, expansion joints, etc., with sections on fields of applications and suggestions for conveyor design. *Mechanical Handling Systems, Inc.* . . . **for your copy, circle No. 289**



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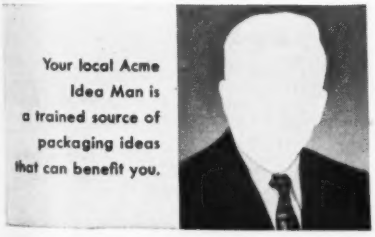

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KNOW-HOW NOTEBOOK . . . Part 2

50 BEST OVERHEAD HANDLING MANUALS . . . continued

Heavy duty and light service, low-cost hoists

Mechanical, electrical and construction details on two classes of hoists are contained in Bulletins 182 and 186. The first, of 16 pages, concerns only the Lift-About Jr. hoist, built in 250 to 2,000-lb. capacity, in lug suspension, hook suspension and push trolley types with single speed, push button and rope controls. The complete line of electric hoists for various applications and industries is covered in the second, smaller booklet, 186, which has photos of all types and a sectional view drawing that shows an entire driving mechanism. *Shepard Niles Crane & Hoist Corp.*

. . . for your copy, circle No. 290

The crane and automation

Subjects such as seven fundamentals of good plant operation; 10 vital selection factors; recent and unusual crane installations, and automatic handling approaches are covered in the booklet, "Planning the Crane for Its Use in Automation." Three types of cranes are discussed, with various classes in each. *Whiting Corp.*

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Selectomatic Control—"Magic in a Box"

Automatic unattended materials handling, its advantages and methods are covered in this 22-page manual. Case histories of systems in use, a chart of equipment and functions, labeled photos and sketches tells a complete story. *The Louden Machinery Co.*

. . . for your copy, circle No. 292

20-p. manual on hand-pushed trolleys

Complete dimensions, diagrams and engineering data are included in this 20-page catalog about hand-pushed trolleys for various load capacities and industrial uses. How the trolleys are adaptable for supporting tools, hoists and carriers of all kinds, as well as on many types of I-beams for monorail applications, is explained. *Jervis B. Webb Co. of Calif.* **. . . for your copy, circle No. 293**

3-types of cranes; 3 styles of trolleys

The line of Load-lifter cranes with three basic types and three styles of crane trolleys is covered in 30 pages detailing operational advantages and design specialties. Complete specification and dimension charts for the three types—1 to 3 ton; 5, 7½ and 10 ton, and 5 to 20 ton (5 styles). *Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc.*

. . . for your copy, circle No. 294

Hoist catalog has cut-out features

By the insertion of four half-width pages with actual cut-outs which synchronize to form a load brake mechanism, this ingenious catalog clearly explains an outstanding feature of the Load King hand hoist. Other design facts are detailed, and pictures of about a dozen hoist types are included. *Yale & Towne Mfg. Co.*

. . . for your copy, circle No. 295

Fact folder on power and free conveyors

A typical layout of the MHS power free conveyor, showing work flow, switches, test, repair and storage lines, is featured in this booklet that fully describes the combination system. Application photos, labeled detail drawings and facts on unit equipment parts are included. *Mechanical Handling Systems, Inc.*

. . . for your copy, circle No. 296

4-page bulletin on cable electric hoists

Cable type electric hoists, with four choices of suspensions, are detailed in this bulletin describing the Quik-Lift of ¼ to 2-ton capacity. Complete description, illustrations and specifications. *Coffing Hoist Div., Duff-Norton Co.*

. . . for your copy, circle No. 297

Motor-driven and hand-geared cranes

Data for underhung and top running single girder cranes are given in two booklets, one for hand-geared types, and the other for motor-driven. Specification charts, condensed descriptions and many photos illustrate the cranes and a number of accessories. *Industrial Crane & Hoist Corp.* **. . . for your copy, circle No. 298**

NEMA classification card for cranes

This handy 8x9-in. card lists and pictures the five crane service classes as established by National Electrical Manufacturers Association (NEMA). Each service class is fully described. *Ederer Engineering Co.* **. . . for your copy, circle No. 299**

Reduces Pipe Handling Time by 83%

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The Tramrail transfer crane travels in the middle bay and connects as desired with the spur tracks over the side bays, thus enables the hoist carrier reaching every part of the room. Incoming pipe is lifted from railroad cars with a Cleveland Tramrail hoist carrier operating on a track serving the floor above and lowered through the hatchway at one end of this warehouse.

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HELPFUL LITERATURE for the West's plant operating executives

FOR YOUR FREE COPIES, circle appropriate key numbers on postcard, page 69

Facts on electronic counting, timing, controlling

Electronic counting, timing and controlling instruments are presented in this short form catalog with easy-to-read sectionalized layout, non-technical language, instrument construction details and price list. Applications, specifications and optional features are given, together with description of plant facilities for research engineering, manufacturing and service. Universal counter-timers, frequency and period counters, time interval meters and decade counting units are among the instruments outlined and illustrated. *Computer-Measurements Corp.*

. . . for your copy, circle No. 151

100 pages to help you select power brushes

Titled "Brushes for Industry," this 100-page plastic-bound catalog contains detailed information on "How to Select and Use Power Brushes," Brushamatic machines, power brushes and maintenance, paint and varnish brushes. The 10-page chapter on selection and use discusses terminology, engineering data, brush selection and other pertinent points. Production-line finishing, varying degrees of automation in finishing and wide range of application are outlined in the brushamatic machines section. Similar detailed specifications, uses and characteristics for each brush are given in the remaining sections of the catalog, which closes with a seven-page alphabetical and numerical index. *The Osborn Manufacturing Co.*

. . . for your copy, circle No. 152

How to select the right push button

This 32-page catalog with full index and price list is designed to show you how to select the right push button for every application. Covering oil tight and general purpose push buttons, pilot lights and accessories, it includes descriptions of components and complete units, dimensions, cam action and schematic diagrams. All types and styles are photographically illustrated. *Furnas Electric Co.*

. . . for your copy, circle No. 153

Your rigging problem and your dollar

It's money in your pocket to read this unique brochure about the engineering that moves, lifts, rolls and carries. Tricky rigging problems and their case history solutions are concisely explained, while graphs show volume, employment and number of project increases in one firm's 30 years of business. How versatility, speed, reliability, safety and progressive thinking can save you dollars in a rigging job is comprehensively covered. *Dalzell Rigging Co.*

. . . for your copy, circle No. 154

Introduction to press brake with pre-set stroke control

This six-page leaflet introduces the Hydra-Power press brake for the production of small precision parts and limited quantity runs. The brake's stroke control feature, which allows the length of the stroke for each job to be pre-set, is thoroughly explained in text and cartoon-type drawings. Several large pictures of the press brake are included and its special features pointed out in accompanying text. Specifications are given. *O'Neil-Irwin-Mfg. Co.*

. . . for your copy, circle No. 155

26 pages of data on sprag clutches

This 26-page, two-color illustrated book describes the range of current uses for overrunning, indexing and backstopping sprag clutches; provides detailed engineering, dimension, installation and maintenance data, and includes suggestions for selection and ordering. It shows typical mounting arrangements for the company's complete line of large-bore, small-bore, heavy-duty, light-duty, high-speed, and all-purpose ball-bearing clutches. The firm's special design service, available to original equipment manufacturers, is described. *The Formsprag Co.*

. . . for your copy, circle No. 156

Data on four types of sheet lifters

Four series of sheet lifters are outlined in this data sheet giving pictures, specifications and optional equipment. Types described are low headroom, loose hook, adjustable and non-adjustable sheet lifters, for one- and two-man operations. *Downs Crane & Hoist Co.*

. . . for your copy, circle No. 157

Selection guide for your conveyor belt needs

Over 20 kinds of conveyor, transmission and elevator belting are outlined in this 8-page catalog giving performance, specifications and sizes for each type. Four types of belt construction—standard ply, step-ply, reinforced top cover and breaker strip—are detailed for varied uses. *H. K. Porter Co., Quaker Pioneer Div.*

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Material Handling Equipment
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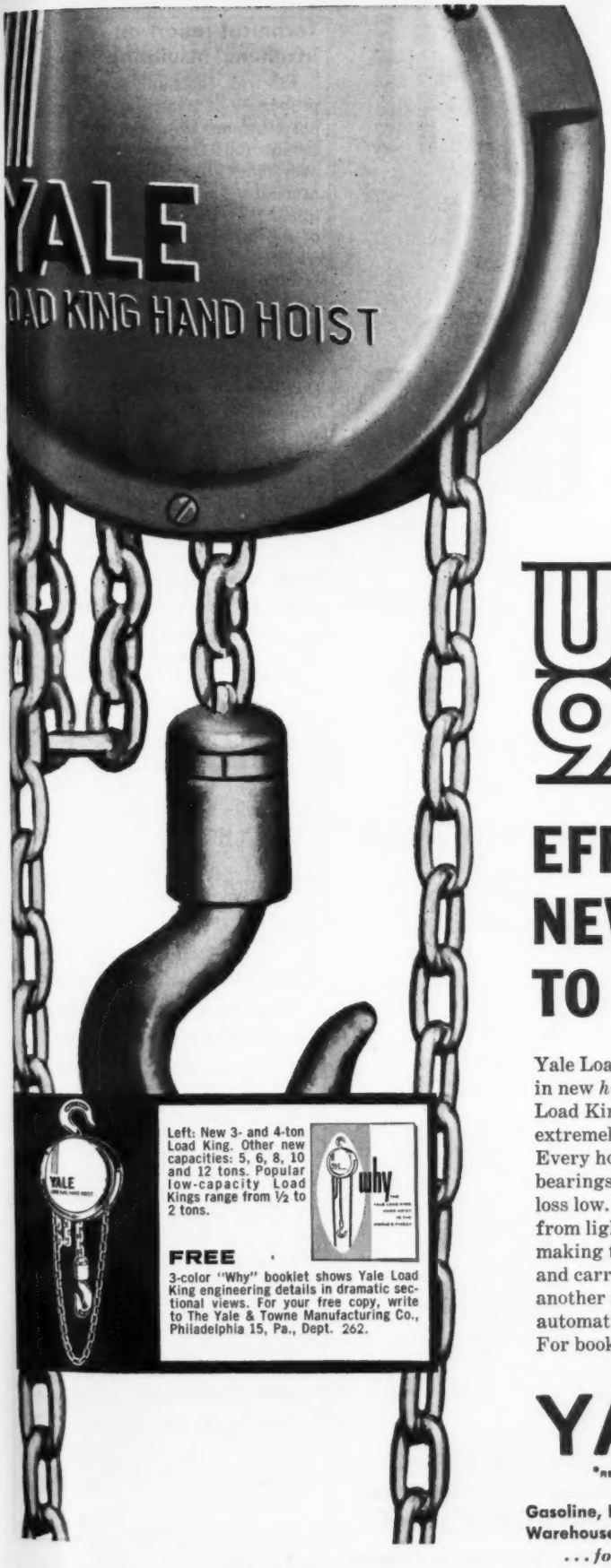

Left: New 3- and 4-ton Load King. Other new capacities: 5, 6, 8, 10 and 12 tons. Popular low-capacity Load Kings range from ½ to 2 tons.

FREE

3-color "Why" booklet shows Yale Load King engineering details in dramatic sectional views. For your free copy, write to The Yale & Towne Manufacturing Co., Philadelphia 15, Pa., Dept. 262.

UP TO 95%

EFFICIENCY! NEW CAPACITIES TO 12 TONS!

Yale Load King Hand Hoists are now available in new *high* capacities—completing the line of Load Kings famous throughout industry for extremely high mechanical efficiencies. Every hoist in this extended line has ball bearings on all rotating shafts to keep friction loss low. All parts are precision-tooled from light, high-strength alloy metals, making these hoists speedy, rugged, easy to use and carry. The Synchromatic Load Brake, another achievement of Yale research, applies instant, automatic, safe-hold brake action between pulls. For booklet of full facts, see box at left.

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Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers Warehousers • Hand Trucks • Hand and Electric Hoists

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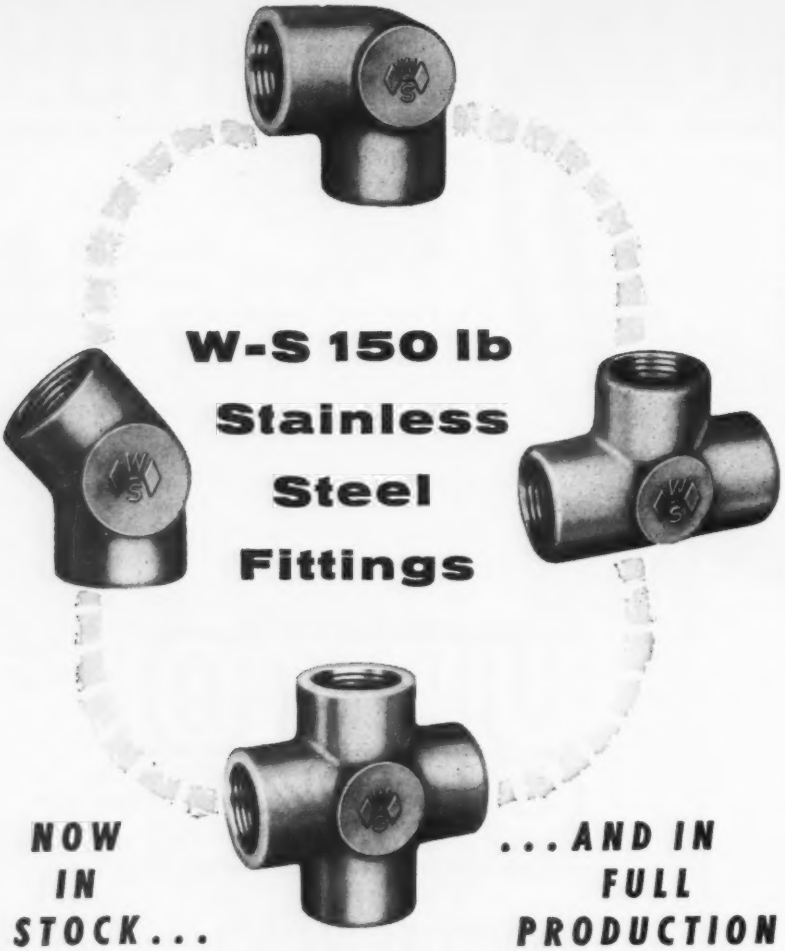

New production machinery and techniques developed at W-S Fittings Division now assure you of prompt deliveries on corrosion resistant stainless steel pipe fittings. Your local W-S stainless steel distributor will be glad to fill your order from his stock.

W-S 150 lb stainless steel fittings, types 304 and 316, resist a wide variety of corrosive services in petroleum, chemical, petrochemical, food and other process industries. They are also ideal for many low temperature operations because of their inherent toughness at sub-zero conditions. W-S 150 lb fittings can be obtained in sizes ⅜" to 4" in either screwend or socket-welding types to meet your needs.

For detailed technical information on our 150 lb line, send today for Bulletin S-3-55. For prompt price and delivery information call your nearest W-S distributor.

Write to W-S Fittings Division, H. K. Porter Company, Inc., P.O. Box 95, Roselle, N. J.

HKP W-S FITTINGS DIVISION
H. K. PORTER COMPANY, INC.

... for more details, circle No. 50 on Reader Service Postcard

Technical report on irrathene insulating tape

Electric, mechanical and general properties of irrathene, an irradiated polyethylene insulating material resistant to temperature surges from overloads, are detailed in a 12-page brochure. Transformed from conventional polyethylene by high radiation in the form of high speed electrons, irrathene is sold as tape or film for insulation winding or wrapping. The book details its outstanding properties such as moisture and chemical resistance, thermal stability, low specific gravity and encapsulation ability. Details on the three different formulations and two types of the material are given. Two pages are devoted to "How to Use Irrathene for Your Insulation Systems." Six specific uses, plus many potential applications, are listed. *General Electric Co.*

. . . for your copy, circle No. 159

How you can put rope to work for you

"15 Ways to Make Rope Last Longer," "Know Your Knots" and "Reeve It Right" are three typical subject headings in a pocket-size 32-page manual about ropes in industry. The fact-filled book gives data on rope sizes, weights and strengths for use in tackles, slings, riggings, angle pulls and transmissions. Rope splicing is treated with clear diagrams for short, long, eye and transmission splices. Twines, synthetic-fibred, and all other types of rope are described in detail for industrial uses. *Plymouth Cordage Co.*

. . . for your copy, circle No. 160

Price and selection data on electric power drives

Normal speed electric motors, geared motors, variable speed transmissions and speed reducers are treated in this 20-page condensed catalog with easy-to-read tables for simplifying selection. The section for squirrel cage motors lists specifications for two types, drip proof and totally enclosed fan-cooled, from ¼ to 200 hp., plus modifications, slide rails and magnetic brakes. Four charts are given for speed reducers, and the gear motor section includes frame selection data, and dimensions for motors, modifications, accessories and magnetic brakes. Similar data is given for the Speedtrol motors. *Sterling Electric Motors, Inc.*

. . . for your copy, circle No. 161

32-page book covers 12 conveyor units

Conveyor units of 12 different types are detailed in this 32-page 8½ x 11-in. catalog. Among the gravity and power conveyor products listed are the Handi-piler with reversible carrying apron; the Extend-o-veyor, a portable type for reaching into trailers, trucks, or across platforms; both incline and level belt conveyors; belt tables, supports and others. Photos of each item, dimension drawings and specification charts are featured in the manual for companies and individuals interested in conveyor units to speed up handling of unit materials in warehouses, shipping platforms, yards, inside box cars, trailers, trucks and in various plant operations. *Standard Conveyor Co.*

. . . for your copy, circle No. 162

"Attempted Murder" is hard hat safety book

This 12-page cartoon booklet, "Attempted Murder," explains the importance of safety head protection and the "care and feeding of hard hats" as taken from case files of Hard Boiled Harry. Graphic cartoons illustrate the four case histories such as "The Case of the Bolt of Death," demonstrating the safety importance of wearing safety hard hats and wearing them correctly. Several types of safety hats made of aluminum, Fiberglass, and ethrene for different protection needs, are illustrated described in picture and text. *E. D. Bullard Co.*

. . . for your copy, circle No. 163

Reprint article offers floor maintenance tips

"Keep it Clean and Save $$$" is the title of an article reprint about floor maintenance containing money-saving ideas on proper selection of floor cleaning and maintenance equipment, plus safety tips for reducing injuries and accidents in industrial plants. Subjects such as dust, sealing, and maintaining all types of floors are treated, and the article gives dollar-saving procedures for care of cement, wood and wood block, linoleum, asphalt tile, rubber tile, cork tile, mastic tile and vinyl plastic flooring. Types of equipment discussed include industrial vacuum cleaners; floor polishers convertible to scrubbers, waxers, sanders and steel woolers; mechanical sweepers and automatic scrubbers. *Wilwite Associates.*

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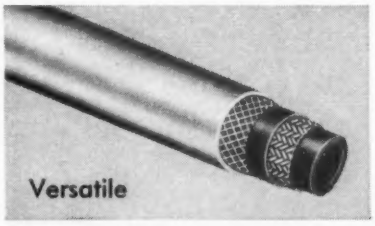
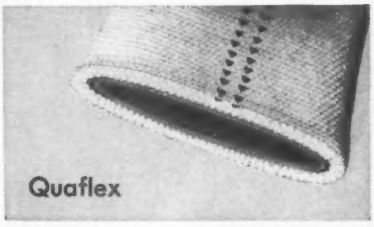
Industrial HOSE?

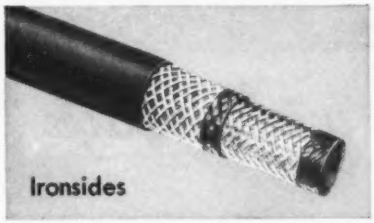
Your Quaker Rubber & Quaker Pioneer distributor has these—and other rugged hoses in stock and ready to go!



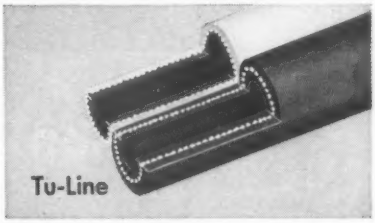
AIR. For heavy duty work. Lightweight, highly flexible. Resists weather damage and abrasion. Non-porous tube of oil resistant rubber compound. Rugged Neoprene cover.



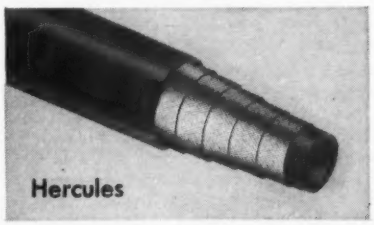
FIRE. For long service in interior fire protection. Resilient, flat-folding. Flexible, crack-resistant. Leak-proof tube bonded to strong single jacket cover.



STEAM. For general steam-handling jobs. Strong, light, flexible, kink-proof. Steel wire and glass reinforcing for extra safety. Resists high pressures and temperatures up to 368°F.



WELDING. Especially effective on portable welding dollies. Kink-free. Resists abrasion and welding gases. Two lines securely bonded together form a single safe hose unit.



WATER. For general water service at medium pressures. Light weight, easy to handle. Non-porous tube resists water absorption. Rugged, slow-aging cover resists abrasion.

Save time and money. Call your Quaker Rubber-Quaker Pioneer distributor *first*, when you need hose or other industrial rubber products.

For further information, write to: ***H. K. Porter Company, Inc., Quaker Rubber Division, Philadelphia 24, Pa., or Quaker Pioneer Rubber Division, Pittsburg, Calif.***

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QUAKER PIONEER RUBBER DIVISION
H. K. PORTER COMPANY, INC.

. . . for more details, circle No. 51 on Reader Service Postcard

How to build your own engine-driven welder

Complete instructions with labeled blueprints, specifications, and photos of finished do-it-yourself welders, are given in this six page open-out folder which presents a composite plan, based on factual experiences, for building portable engine-driven welders. Sections are devoted to engine, base coupling, governor, canopy, radiator and each other component part of the unit to be used with the Lincoln welding generator. *The Lincoln Electric Co.*

. . . for your copy, circle No. 165

User manual on carbide-tipped saws

Segmental, rip, cut-off and combination saws are among the 8 types of silver steel carbide-tipped saws treated in this 8-page manual. Opening with a general information page, it presents photos and specification charts for all the products, plus an application chart showing which saws are best suited for 21 different woods, metals, plastics and composition materials. *Atkins Saw Division, Borg-Warner Corp.*

. . . for your copy, circle No. 166

ALGAS *wins again*

ALFRED M. LEWIS Company Selects ALGAS LP-Gas Equipment for Material Handling Trucks

SAVES
50% in
MOTOR MAINTENANCE
60% in
OIL CONSUMPTION

After investigating all makes of LP-Gas equipment, Alfred M. Lewis Co., Wholesale Grocers of Riverside, Calif., selected ALGAS and one other leading brand to make an "on-the-job" test. They checked operation, performance and economy. Once more ALGAS proved its superiority and today more than 45 ALGAS equipped fork-lifts are operating on LP-Gas in the company's four warehouses. Result: savings of at least 50% in motor maintenance; better than 60% savings in oil consumption and smoke and fumes are eliminated.

Investigate ALGAS LP-Gas equipment today

AMERICAN LIQUID GAS CORPORATION
1109 Santa Fe Avenue • Los Angeles 21, California

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Vest-pocket handbook gives unit heater data

Designed for easy carrying, this vest-pocket edition of a unit heater handbook with 64 pages outlines specifications and operating characteristics, together with installation and application data, for the complete Venturafin line. A handy source of unit heater information for on-the-job calculations, it gives information such as capacity tables, dimensions, engineering specifications, external ductwork suggestions, mounting heights, pipe sizes, sound ratings and diagrams for piping and wiring. Other features are a typical selection problem with its step-by-step solution, and easily-understood line drawings for further clarification of information. *American Blower Corp.*

. . . for your copy, circle No. 167

Arcair torch folder gives case histories

Six illustrated case histories showing applications of the Arcair torch are featured in a 4-page brochure about metal removal problems. Foundry casting cleaning, tank fabrication, cast iron cutting, and other uses are detailed in the booklet which explains the compresseed air process item and presents thee line's new model H-3 torch for cutting, gouging, beveling or grooving of all metals. *Arcair Co.*

. . . for your copy, circle No. 168

How to use industrial cleaning compounds

Cleaning compounds and solvents of eight different varieties for industrail use are detailed in this 8-page folder punched for notebook insertion. Application sketches, thumbnail descriptions for quick reference and more detailed data for ordering are given for products such as liquid steam cleaners, rust and scale solvents, aluminum polish, solvent degreasers, carbon removers, etc. *Brulin & Co., Inc.*

. . . for your copy, circle No. 169

Bulletin on batteries for industrial trucks

This four-page specification bulletin deals with the complete line of Slyver-Clad batteries for use in rider-type electric industrial trucks. Data on battery ratings and capacities, details of design and construction, dimensions and weights are included. *C & D Batteries, Inc.*

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"HOT SPOTS" CAN PLAY THE DEVIL WITH PRODUCTION

Excessive radiant heat from such isolated hot spots as ovens, furnaces, presses, heat treatment and kilns reduces the operators' ability to lose body heat naturally by as much as 45%. This slowing down of physical exertion and concentration inevitably results in LOSS OF PRODUCTION!

Colt has been called in many times to solve this particular problem and has succeeded in each case with a ***combination mechanical and natural ventilation system!***

COLT INFLOW UNITS, pictured below, provide perfect year 'round ventilation, regardless of outside air temperature. These powered units can be assembled in a great variety of ways. Re-circulating dampers can be adjusted in cold weather to re-circulate warm air within the building, or to mix cool fresh air from the outside and warm air from the inside, creating warmed fresh air without the cost of additional heat.

Investigate, today, how Colt can save management thousands of dollars yearly in lost production due to employee discomfort and fatigue.

THE COLT SYSTEM OF VENTILATION

COLT INFLOW UNITS "clear the air" in a factory in England.

Send for your copy of the ***FREE TECHNICAL MANUAL*** giving full details of the Colt System. ***FREE ENGINEERING SERVICE*** includes a thorough survey and a report complete with schemes and drawings, ***ALL WITHOUT OBLIGATION.***

COLT VENTILATION OF AMERICA, INC.

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44 pages of chain sling information

Helpful data on the use, care and inspection of chain slings, as well as specification and working load limit charts for each of the many types available, are contained in this 44-page book. Ordering information including type symbols is discussed for single, double, triple, quadruple, basket, endless, adjustable and other chain slings made of alloy steel, high test steel or wrought iron. Inspection tips include an annealing table for wrought iron chain and a table for wear, indicating minimum safe diameter at worn portions. *Republic Steel Corp.*

. . . for your copy, circle No. 171

Thumb-indexed guide to valve selection

Thumb-indexed for easy reference, this 24-page revision of "Guide for Selecting Valves, Boiler Mountings, Lubrieating Devices," groups valves according to steam pressure ratings and also gives water, oil and gas ratings. The first 15 pages illustrate regular valves including application of boiler mountings. The remainder of the guide illustrates other valves and products according to class of service or product. *Lunkenheimer Co.*

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Air duct treatise is six guides in one

This 134-page engineering treatise primarily designed for presenting facts on aluminum air ducts, also contains five specific areas of other information making the ring-bound book six guides in one. Sections are devoted to a resume of aluminum's advantages for air ducts, recommended alloys and tempers with their properties, prefabricated ducts, and research recommendations for ductwork noise control, in addition to the five guides — engineering; estimating; drafting; mechanic's guide on fabrication of aluminum ducts and mechanic's guide for installing these ducts. The book, which has over 350 illustrations, closes with an appendix giving details on calculating infiltration heat loss by the crackage method, as well as a complete glossary of terms. Obtain your copy by writing on your letterhead direct to *Reynolds Metals Co.*, 2500 So. Third St., Louisville, Kentucky.

20-page data book on Diehl electric motors

This 20-page consolidated catalog and price list opening with index and ordering information, contains pictures, cutaway drawings and dimension charts for 8 types of electric motors, as well as for motor modification items and adjustable bases. The list includes integral hp. motors with either old or new NEMA frames; flat-type, chemical, power transmitters, disc brake, single phase and polyphase fhp. motors. In the four pages of engineering data that conclude the book, there are sections on standard motor speeds, insulation, dynamic balance, ambient temperature, torque characteristics, etc. *Diehl Manufacturing. Co.*

. . . for your copy, circle No. 173

12-page data book on welded steel tubing

Helpful technical data about welded steel tubing is given in this detailed 12-page brochure. Steel tubing selections available, including variety of lengths, special shapes, types of finishes and types of steel, are listed. Size and gage charts for tubing types such as round and square-welded, hot and cold-rolled, and rectangular welded hot and cold-rolled are presented plus tables for mandren drawn cylinder tubing, standard mechanical mandrel drawn tubing and sink drawn mechanical tubing. *Revere Copper & Brass, Inc.*

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Facts on new line of internal gear rotary pumps

Five new series of internal gear rotary pumps are given thumbnail descriptions in a folder that features a return card section for catalog requests. Display copy points up seven salient features of the pump series designed for light to medium viscosity fluids, hazardous liquids, rugged duty packed or sealed for truck or power unit mounting, and steam jacketed, for high viscosity liquids. *Wayne Pump Co.*

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How to stop corrosion in cooling tower pans

Specific application instructions for a proven system of corrosion protection on cooling towers, using neoprene coating, are given in this illustrated catalog sheet. Presented in terms of problem, solution and results for a specific company, the data sheet describes the liquid neoprene process for use on cooling tower drip pans and structural members. *Gaco Western.*

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32-page manual on protective coatings

Over 100 actual color chips to show the range of colors available for protective coatings on rustable metals throughout industry are a feature of this 32-page full-color manual. The treatise also outlines the results of over two years of research in areas where excessive moisture, salt spray, fumes, gases, weather and other rust-producing agents are severe. Application photographs give valuable ideas for protecting girders, tanks, water steam and brine piping, stacks, boilers, fences, etc. Types of coating such as primers, fast-drying indoor and outdoor short oil, and long oil type are illustrated by the color chips, which also serve to point up coating for machinery, implements and oil field equipment and for marine, chemical industries, mills and plants in general. Other coatings described separately are galvinoleum, masonry, heat- and chemical-resistant, plus clear liquid sealer and the Surfa-Etch solution for concrete. *Rust-Oleum Corp.*

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Facts on remote control of machinery and valves

The Secoder, an electro-mechanical device for remote control of machinery and valves, is described in detail in this bulletin. The secoder is used in control of other electrically actuated apparatus as well as in connection with magneto and other coded-ring telephones, providing simple means for selective ringing. *Electrical Communications, Inc.*

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Lube equipment, spray guns and pumps

This 34-page manual describes more than 30 kinds of lubricating equipment and accessories, material handling pumps and spray gun supply pumps, with product and application pictures and cutaway drawings. A fittings and comparison guide chart lists some 50 sizes in grease fittings, and other charts are shown for lubricator and valve selection, for lubricant pumps, hose assemblies, replacement hoses, hose adapters and spray gun material tips and air caps. The brochure concludes with 3 pages on parts and service data, warranty statement, and sites of branches. *Gray Co., Inc.*

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. . . *for more details, adv. opp. pg., circle No. 54 on Reader Service Postcard* ➡

The FALK all-steel Shaft Mounted Drive

- *Versatile*
- *Efficient*
- *Economical*
- *Compact*

SIX SIZES—½ TO 30 HP—420 to 10 rpm—single and two double reduction ratios—output torque ratings up to 21,000 lb-in.

To Plant Engineers:

The versatility of the Falk Shaft Mounted Drive makes it the practical choice for many machines in your plant.

This compact unit mounts on the driven shaft, thereby solving many problems of restricted space. You can obtain almost any output speed between 420 and 10 rpm by selecting the proper single or double reduction unit and the proper sheave or sprocket ratio.

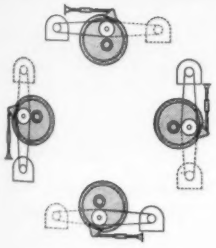
Do you need both horizontal and vertical drives? Standard Falk Shaft Mounted Drives are available for either application; or you can easily convert a horizontal unit to a vertical unit, right in your plant.

Initial cost is low, you get immediate delivery from shelf stock, and installation is quick and easy.

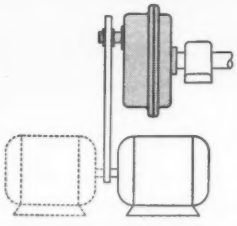
★

FALK Shaft Mounted Drives are available from factory and distributor stocks *from coast to coast.* See your Falk Representative or Distributor—or write direct for your copy of **Bulletin 7101.**

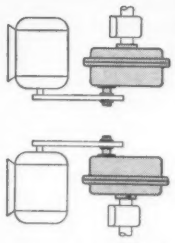
A few of the many ways this reducing unit can be applied—



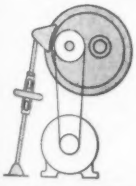
ANY POSITION



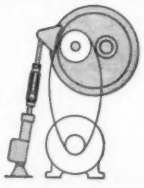
MOTOR EXTENDED
—or below the unit



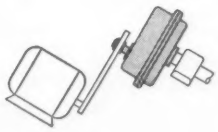
VERTICAL—UP or DOWN



VARIABLE SPEEDS...
through use of variable-pitch sheaves—automatic belt adjustment with tie-rod adjustment



OVERLOAD RELEASE...
that will slacken belts and cut off power if overload occurs



INCLINED SHAFT...
Any standard unit can be mounted in vertical or inclined position by a simple rearrangement of oil drains

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- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
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- Single Helical Gears
- Herringbone Gears
- Marine Drives
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- Weldments
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FALK

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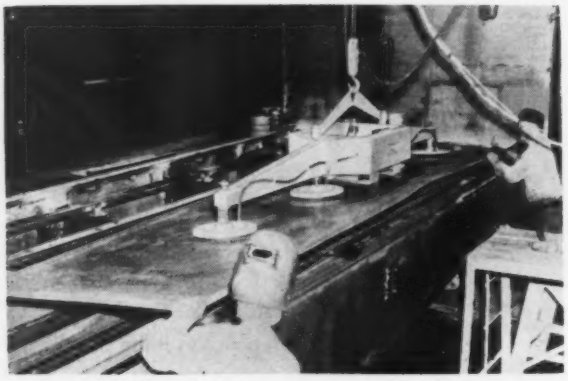
NEW EQUIPMENT for Western plant operation, production, and maintenance

USE RIP-OUT POST CARD, page 69, for more information on products described.

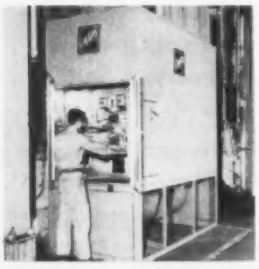
THE "VAC-U-LIFT" SYSTEM
. . . for handling non-porous materials



Using a vacuum "Power Pac" with a compact rotary pump controlled by a 5-way solenoid valve, this system incorporates the induced vacuum principle with metal Vac-U-Pads, for lifting and holding non-porous materials. The pads, vari-shaped for particular applications, come in direct contact with the material and sealing action is controlled through a special sealing ring attached to the pad's perimeter, with the ring creating the vacuum. In materials handling where size, flexing and surface protection are important, the Vac-U-Lift system is effective and complete safety is assured through a reserve vacuum system that maintains positive grip while lifting, even if power fails. Round pads are available in various types from 2¾ to 18 in. diameter with 25 to 1,200 lb. lifting capacity, while rectangular pads come in types from 5 x 15 in. to 12 x 35 in. with capacities from 275 to 2,000 lb. *Vac-U-Lift Company.*

. . . for more details, circle No. 181 on postcard

FORCED AIR SPACE HEATERS
. . . with pyro-jet burner that fires gas or oil



An induced draft pyro-jet burner suited for gas, light or heavy oil, or combination gas and light oil firing, is a design feature of the new line of Counterflo heaters with increased air-heat volumes and reduced fan horsepower requirements. The new models come in nine sizes, from 250,000 BTU per hour to 2,000,000 BTU per hour output capacity; have instant fuel changeover, by a manually or thermostatically operated switch, and employ air atomization and a dual preheating system for firing heavy fuel oil. Air-heat ratios in the assembly will range from 11,000 cfm. to 16,000 cfm. per 1,000,000 BTU per hr. output, and fan horsepower requirements range from ½ hp. to 7½ hp. Made in a two-part design that gives flexibility in matching fan requirements with heater output capacities, it has a furnace section with the pyro-jet burner, stainless steel combustion chamber, secondary heat transfer tubes of aluminized steel and electronic flame failure protection. The second, circulating fan, section contains forwardly curved, low speed, double inlet fans. *Dravo Corp.*

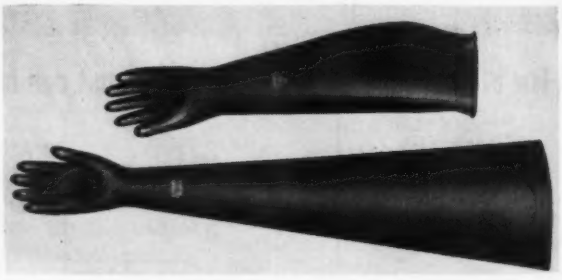
. . . for more details, circle No. 182 on postcard

TANK-LINING MATERIALS
. . . ready-cured, chemical-resistant

This ready-cured synthetic rubber lining material, Fairprene T-5594, developed for tank lining applicators and firms doing their own lining, provides superior chemical resistance, requires no refrigeration since it is stable in storage, and has stretch approaching that of natural rubber lining. It is offered as part of a package consisting of primers and adhesives for adhering to supporting metal tanks, an adhesive for strapping seams, and putty for filleting joints and corners. Available in a two-ply, 50-in. width at ⅛-in. thickness it can also be used, with modification, to cover wood or concrete. *E. I. duPont de Nemours & Co.*

. . . for more details, circle No. 183 on postcard

DRY BOX RUBBER GLOVES
. . . used in atomic energy, nuclear research



Complete arm protection, because of extra length, is provided by these gloves for workers in dry box processes at atomic energy plants and nuclear research laboratories. Similar to standard industrial gloves, they are made of neoprene with curved fingers for comfort and flexibility. Regular lengths are 27 in., with a 5-in. inside sleeve-top opening, and 30-, 32- and 36-in. lengths with 8-in. inside opening. Glove and sleeve thicknesses can be varied for any specific requirement. *Surety Rubber Co.*

. . . for more details, circle No. 184 on postcard

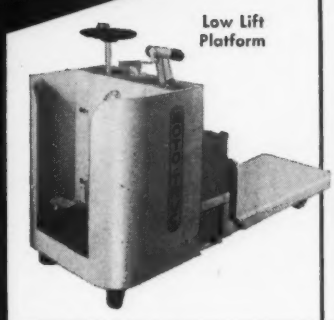
POWER HACK SAW BLADE
. . . with only 3 teeth per inch

Removing more chips of metal per tooth is possible with this power hack saw blade which has a design permitting more efficient sawing of both large ferrous and non-ferrous metal sections and billets. Increased production while lowering cutting costs is promised for the blade which is being made in three Disston brands—Super-Safe, High-Speed and Di-Mol—available in 14, 18, 21 and 24-in. lengths. *Henry Disston Division, H. K. Porter Co., Inc.*

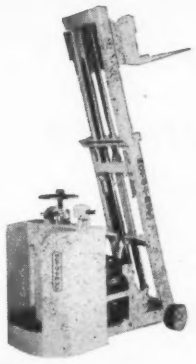
. . . for more details, circle No. 185 on postcard

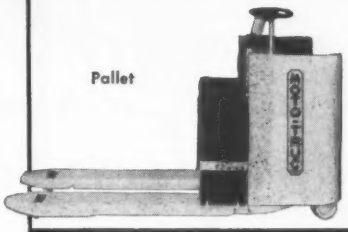
MOTO-TRUC

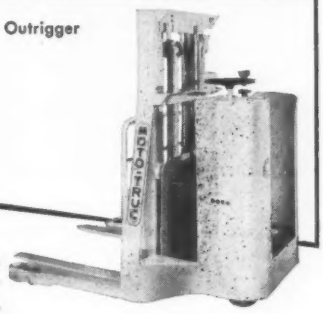
Builds Riding Models Too!


Low Lift Platform

"Bull Dog" Grip All Tractor


Counterbalanced


Pallet


Outrigger

Originators of the "Walkie" truck also offer a complete line of "Ride-a-man" models.

Do you need an industrial truck that combines the speed and convenience of a rider type with the lower cost and maneuverability of a "walkie"? Then Moto-Truc "Ride-A-Man" electrics are your answer. They are light weight and small, yet packed with plenty of power for a full eight hours operation on most jobs. No need to sacrifice quality or dependability either. Moto-Truc skill gives you features like these —

- **Powerful Drive** — heavy duty, 18 volt motor with chain first reduction, spur gear second reduction drive unit.
- **Direct Acting Brake** — automotive type brake mounted directly on the drive wheel is operated by foot pedal.
- **Responsive Controls** — convenient roller grip control, designed by Moto-Truc, is easy to operate and simple to maintain.
- **Easy to Service** — completely accessible for quick easy maintenance.

Although built to operate in narrow aisles and congested areas, "Ride-A-Man" trucks give the operator a break too . . . plenty of standing room . . . outstanding all around vision make them safe and comfortable to operate all day long.

If your job calls for a small rider type truck — compare values and you'll always buy Moto-Truc.

Get All The Details

Write for either, or both, of these brand new catalogs —

56-R "RIDE-A-MAN" MODELS

56-W "WALKIE" MODELS

Largest exclusive manufacturers of "Walkies" and Ride-A-Man Trucks

The MOTO-TRUC Co.

Representatives in Principal Cities

1963 E. 59th St. Cleveland 3, Ohio

Pallet . . . Platform . . . Hi-Lift Truck

. . . for more details, circle No. 55 on Reader Service Postcard

*$18.50 is the list price for the ¼" port size and $19.50 for the ⅜" less usual quantity discounts.

250 P.S.I.

4-WAY VALVES

for Air and Cost-Minded

TOOLING and PRODUCTION MEN

Important Savings	Low initial cost. Need no oilers and filters (time and materials savings).	All components are corrosion resistant.
Low Maintenance	Sealing qualities do not diminish with long, continued use.	Wear compensating "Shear-Seal" design.
Long Service Life	No production delays. Maintenance (rarely needed), without disturbing plumbing.	Lapped metal to metal sealing members.
Not Critical to Dirt	No scoring or binding. (As with spool or poppet designs.)	Flow is through "Shear-Seals." Sealing surfaces remain in constant intimate contact.
No Creeping Cylinders	Leakproof closure. (No internal port to port leakage.)	Maintained through lapping action of each operation.

Ask for bulletin A-5.

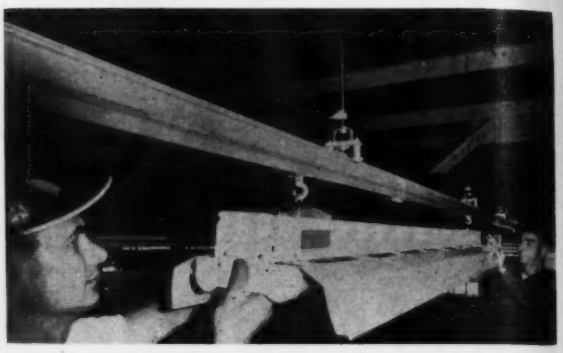
Foot operated models with or without spring return to reverse or to center are $24.50 list for the ¼" and $25.50 for the ⅜" valve less quantity discounts.

BARKSDALE VALVES

5125 Alcoa Avenue, Los Angeles 58, California

. . . for more details, circle No. 56 on Reader Service Postcard

ROLL-IN BUSWAY TECHNIQUE
. . . cuts installation time



A roll-in method for installing busways, employing a winch and roller-type hangers, can cut installation time in half, so that the entire run can be hung in the time previously required to hang fixtures alone. The cost of installation, too, is reduced by as much as 50%, according to manufacturers' estimates. With the assembly-line method allowing busway and fixtures to be hung simultaneously, both can be put in before permanent flooring machinery placing, thus avoiding interference with other plant construction. *General Electric Co.*

. . . for more details, circle No. 186 on postcard

ZIPPERTUBING
. . . for electrical harness assembles

Zippertubing is a zipper-style plastic tubing designed for the lacing and typing operation of electrical harness assemblies. It is used to enclose, identify and protect multi-conductor wiring in the aircraft, electronic, or electrical industries. Although it was designed as a substitute method for lacing and tying, the tubing can also be used for wiring ducts, wire marking in short lengths and as a replaceable cable jacket to pretect custom cables from abrasive wear. The pull-tab used to close the tubing is detachable and the tubing may be unzipped and re-used, or permanently sealed with a sealer provided by the manufacturer. *W. A. Plummer Mfg. Co.*

. . . for more details, circle No. 187 on postcard

✔ *check*

the many advantages of

SORBOCAST

CAST IRON

DAYTON FOUNDRY

Hollydale, Calif. · NEvada 6-1251

. . . for more details, circle No. 94 on Reader Service Postcard

. . . for more details, adv. opp. pg., circle No. 57 on Reader Service Postcard

"A wing and a prayer" ...and plenty of nuts and bolts!

ABOUT A THOUSAND assorted nuts and bolts keep this airborne performer in one piece despite the beating it takes show after show.

Obviously, the fasteners that keep the parts together have to be strong and flawless to stand up under the terrific stresses.

They do a big job, these standard fasteners. Take the automotive industry alone — over *10 billion* fasteners used last year!

RB&W — A MAJOR SUPPLIER TO INDUSTRY

A leader in the field for over 111 years, RB&W turns out the finest fasteners possible to meet the insatiable needs of automotive and other major industries.

Modern facilities, new techniques, long experience . . . all combine to make RB&W fasteners truly the "strong point of any assembly."

SEND FOR THE RB&W "FASTENER MAN"

If the product you make is assembled with fasteners, chances are the RB&W "Fastener Man" can find a way to save you money. He can recommend and supply the right standard fastener for just about every job. Contact your nearest RB&W office.

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Los Angeles, Calif.; Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill.; **Additional sales offices at:** San Francisco; Dallas; Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago. **Sales agents at** Denver; Milwaukee; New Orleans. **Distributors** from coast to coast.

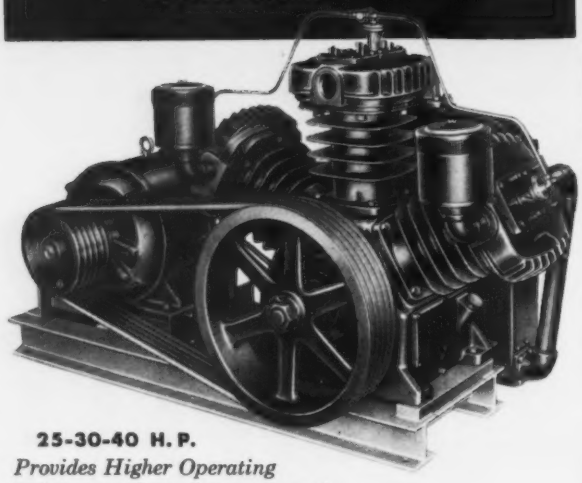
RB&W FASTENERS - *Strong Point of any assembly*

CURTIS MODEL C-100

Two-Stage, Air-Cooled Air Compressor

Delivers *MORE* Air...

PER MINUTE HORSEPOWER KILOWATT HOUR OF ELECTRICAL ENERGY CONSUMED



25-30-40 H. P.

Provides Higher Operating Efficiency Costs Less to Install

The Curtis Two-Stage Compressor assures a saving in your power costs. It's air cooled, thereby eliminating expensive water bills—quick and easy installation with no complicated plumbing problems.

The new C-100 embodies all the well-known Curtis engineering features such as centro-ring oiling and Timken Main Bearings.

For complete information write for illustrated folder.

YOU CAN COUNT ON REMEMBER...

Curtis

OUR 103rd YEAR

MANUFACTURING COMPANY

PNEUMATIC DIVISION

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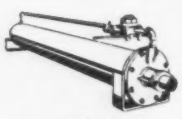
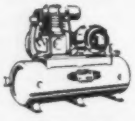


AIR HOISTS
AIR CYLINDERS



AUTOMOTIVE
AIR COMPRESSORS

PACKAGED AND REMOTE AIR CONDITIONING

CM-21

L. L. MEIKLE—West Coast Representative
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R. K. McCoy, 3033 San Pablo Ave., Berkeley 2, Calif.
Ed Craven, 1018 Southeast Eighth Ave., Portland 14, Oregon

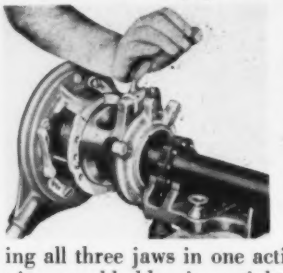
. . . for more details, circle No. 58 on Reader Service Postcard

8,000-LB. OUTDOOR TRUCK
. . . with standard power brakes and steering

Power brakes and steering and finger-tip directional control are standard equipment on this 8,000-lb. capacity fork lift truck for outdoor use. With four speeds in each direction, the pneumatic-tired truck will travel 16½ mph. forward and 16 mph. in reverse as well as climb a 21% grade loaded. Water, fuel and hydraulic filler caps are located outside the engine for quick access while major engine components are reached through hinged side louvers covering the engine. An engine hour meter, ammeter, oil pressure gage, fuel and temperature gage, ignition switch and starter button are all mounted on a panel on the steering column. The axle-mounted telescopic upright which tilts 4 deg. forward and 12 deg. backward, has an automatic tilt-lock valve to prevent upright drift. Called the Yardlift 8024, the unit measures 132 in. long and 77 in. wide. *Clark Equipment Co.*

. . . for more details, circle No. 189 on postcard

TRUE-CENTERING WORKHOLDER
. . . for use on pipe threader



A perfect thread every time even if pipe is over or under size is assured with this workholder for use with the Ridgid 65R pipe threader, because all three workholder jaws close simultaneously. User pre-sets workholder cam plate to desired pipe size, thus adjusting all three jaws in one action. When threader is on the pipe, workholder jaws tighten as the 3-jaw action continued by pump of operator's hand on forged cam lever. Said to eliminate crooked or lopsided threads, the workholder can be used with previous style 65R threaders by putting it on present 65R die stock, which is jamproof, threads 1 to 2-in. pipe or conduit with one set of dies, and permits size changes in eight seconds. *Ridge Tool Co.*

. . . for more details, circle No. 190 on postcard

AUTOMATIC COUNTER
. . . for air or hydraulic-controlled operation

This automatic counter designed for use on any operation controlled by pneumatic or hydraulic action screws into the line controlling any air or hydraulic cylinder. The counter will handle up to 300 counts per minute. There is no linkage to assemble and no solenoids. The five models available, all with five or six digits, include units with counter clockwise rotation of numbers, clockwise rotation of numbers, a hydraulic counter and a pneumatic and hydraulic activator for electric counters. *Pneumaticount.*

. . . for more details, circle No. 191 on postcard

Photo through courtesy of Eaton Manufacturing Co.

MASS PRODUCTION means mass handling . . . and no other handling system can match the **Powell Flowmatic*** when it comes to smoothly and efficiently moving volume parts and materials in process. Watch it in action . . . talk with those using it and you'll understand why Flowmatic* is called the *"hottest thing in handling in a decade."* Literature upon request.

*Patent: No. 2762529

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IRA G. PERIN COMPANY
575 Howard Street
San Francisco 5, California
GArfield 1827

S. CALIFORNIA
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Los Angeles 22, California
RAymond 3-5233

WASHINGTON
AIR MAC INC. OF WASHINGTON
3838 Fourth Ave. S.
Seattle 4, Washington
MU-3388

OREGON
AIR MAC INC. OF OREGON
1435 S. E. Union Avenue
Portland 14, Oregon
FIlmore 6524

UTAH
EQUIPMENT SUPPLY COMPANY
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127

POWELL
PRESSED STEEL
SINCE 1920
THE POWELL PRESSED STEEL CO.
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Faster, better service made possible by the convenient location of an Indair dealer near your business. Dial Indair for your welding and cutting needs.

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You can save up to

80%

in fabricating costs—with

COPPER FURNACE BRAZING

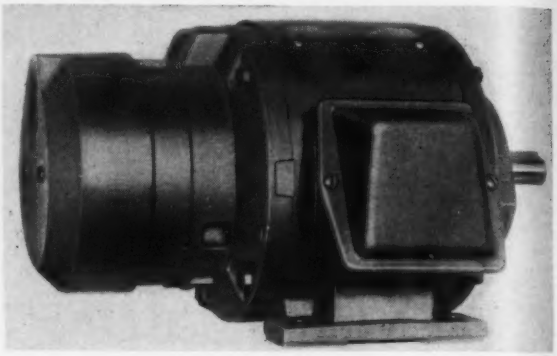
Superwelding is an improved high temperature process for permanently bonding together ferrous metal parts at lower cost through the reduction of expensive machining operations. There are many fabricating advantages such as pressure-tight joints, freedom from distortion, and elimination of cleaning or pickling.

For further information call STanley 7-3121

SUPERWELD CORP.
6840 Vineland Ave., No. Hollywood, Calif.

. . . for more details, circle No. 61 on Reader Sedvice Postcard

CAST IRON BRAKEMOTORS
. . . stop instantly, hold heavy loads



A torque range from 3 lb.-ft. to 345 lb.-ft., one-piece molded friction linings for quick stops, and one-operation torque setting are features of a new line of rugged cast-iron brakemotors. Problems of power failure or low voltage are lessened since "dead man" operation sets and holds the load until normal operation is restored. The design includes few wearing parts, and the entire operating mechanism is easily adjustable with ordinary tools by simply removing the brake housing to lift out the unit. Enclosures available for the brakemotors include those suitable for outdoors or where very moist, corrosive or abrasive dust conditions exist. *Reliance Electric & Engineering Co.*

. . . for more details, circle No. 192 on postcard

SOLDERING IRON
. . . for almost all your soldering jobs

This air-acetylene unit designed to handle all but the heaviest soldering jobs, heats up to full working temperature in less than two minutes and does the work of a pair of furnace-heated 3-lb. irons or an 880-watt electric iron. Called the Prest-O-lite 406, it features a form-fit handle and convenient thumb rest, permitting unusual ease of operation. Stainless steel stem and tube-within-a-tube contruction retard heat conduction to the handle and a needle valve at the rear of the handle affords precise flame adjustment without overheating soldering copper. The 406 M medium iron is available with interchangeable pointed or chisel-edge copper heads. *Linde Air Products Co.*

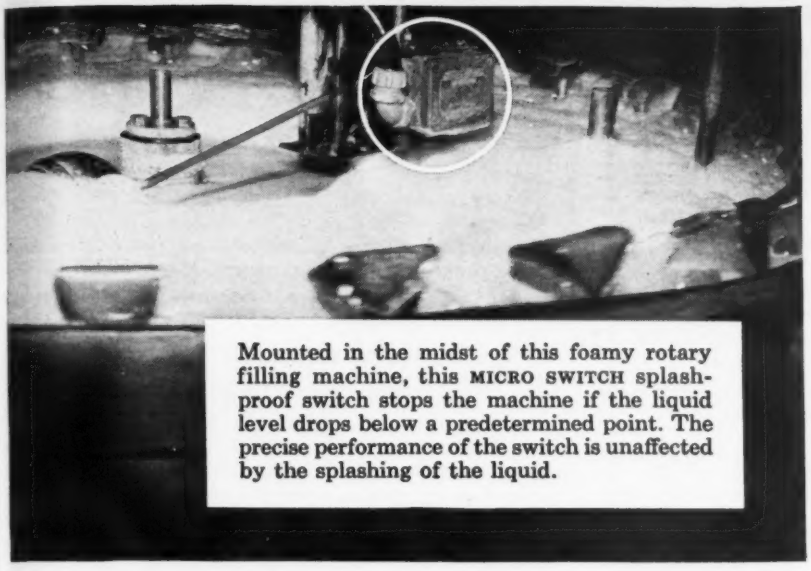
. . . for more details, circle No. 193 on postcard

ANTI-CORROSION COATING
. . . comes in color, metallics

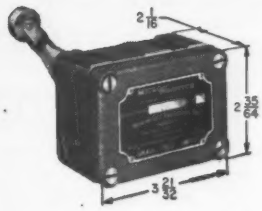
Profilm, a silicate modified coating that looks like paint and can be sprayed on, is designed for use where acids, alkalies, weather conditions, and other corrosive elements contribute to coating failure and high maintenance cost. The quick-drying profilm comes in colors as well as black, white, clear and metallics, in both baking and air-dry grades. Applicable to metal, masonry, wood, asbestos and other surfaces, it is said to provide a uniform, continuous low porosity film resistant to most chemicals. Non-toxic and fire retardant, the coating will not stick to cement and scum does not form on it when exposed to air. *Allied Porcenell, Inc.*

. . . for more details, circle No. 194 on postcard

MICRO SWITCH . . . FIRST IN PRECISION SWITCHING



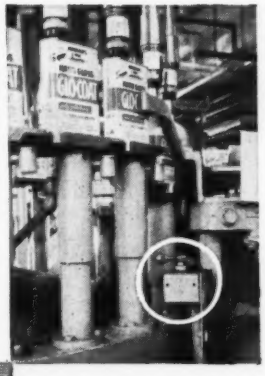
Mounted in the midst of this foamy rotary filling machine, this MICRO SWITCH splash-proof switch stops the machine if the liquid level drops below a predetermined point. The precise performance of the switch is unaffected by the splashing of the liquid.

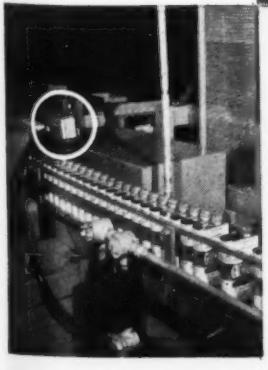


MICRO SWITCH Splash-Proof Switches are constructed to resist the splash of liquids. A seal on the actuating shaft and a gasket on the cover gives a good seal against normal splash conditions. A heavy aluminum housing protects the enclosed switch. These switches combine long electrical life with accurate repeatability. They are available with adjustable roller-arm actuators (shown) or with push-rod plunger actuators. Can be supplied with a variety of electrical ratings and contact arrangements.

Splashed all day with liquid wax...

MICRO SWITCH precision switch is used to prevent "jam up" on a rotary can-filling machine. If the platform sticks and does not lower to the level of the conveyor, the switch stops the conveyor until trouble is corrected.





Switch at the left is held operated by the nozzles of the cans. Should a can be upset, or reversed, the switch actuator releases, opens the circuit and the conveyor stops. Another switch keeps track of the supply of knock-down shipping cases, in a similar manner. It stops the conveyor if the supply is low.

MICRO SWITCH Precision Switch performance is unaffected

MICRO SWITCH controlled equipment is faster and more efficient—produces more in less time. Thousands of plant superintendents, electricians and maintenance men have made their equipment "perk up" with MICRO SWITCH precision switches.

Johnson's Wax Company engineers chose splash-proof MICRO SWITCH precision switches to control packing equipment in their modern Racine plant. From controlling the level of the rotary filling machine, through every packaging step, MICRO SWITCH units insure safe, efficient operation as over 200 cans are filled in each line per minute.

There is a MICRO SWITCH distributor near you. Let him show you a variety of switches and practical applications that have paid off for others. Send for MICRO TIPS DIGEST. It's jam-packed with ideas.

See MICRO SWITCH Catalog No. 83 for complete information on the wide line of heavy-duty precision switches for industrial use. Wire today.

MICRO SWITCH
A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

. . . for more details, circle No. 62 on Reader Service Postcard

TRENT Engineering and Design Trouble-Proofs **IMMERSION and CIRCULATION HEATING UNITS!**

For Efficient Immersion Heating of

- *HOT WATER TANKS*
- *WATER BATHS*
- *RINSES AND CLEANERS*
- *GLUES AND OILS*

Rugged Trent Water Immersion Heaters are available in a complete range of types and sizes for heavy duty service up to 100 KW in single packaged unit.

Dependable, Trouble-Free Heating for

- *CIRCULATING OIL SYSTEMS*
- *ATOMIZATION*
- *HEAT TRANSFER FLUIDS*
- *STORAGE TANK HEATERS*

Heavy duty Trent Oil Immersion Heating Units offer packaged unit design in a range of sizes for service up to 50 KW.

TRENT IMMERSION AND CIRCULATION HEATERS ARE UL AND CSA APPROVED

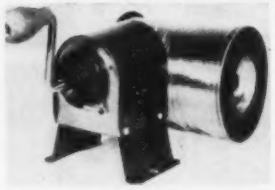
Let Trent's more than 25 years' manufacturing experience solve your heating problem. Discuss your application with a Trent representative today!

Trent Representatives in Principal Cities Coast to Coast

TREN INC.
Electrically Heated Industrial Equipment
242 LEVERINGTON AVE., PHILA. 27, PA.
In Canada Supreme Power Supplies Limited Toronto 14

. . . for more details, circle No. 63 on Reader Service Postcard

SLEEVING CUTTER
. . . cuts up to 10,000 pieces per hour



This compact, bench-type high-capacity tool will cut all types of insulation tubing including Fiberglass and silicon-coated nylon, as well as small wire and solder. Hand or motor operated, it can cut 10,000 pieces per hour in lengths from 1/32 to 2 in. and is for any size sleeving up to ¼ in. diameter. All of its vital moving parts are of case hardened steel and the high-speed steel cutting knife is easily removable for resharpening or replacement. Dimensions are 5 x 5½ x 6 in. and the weight is six pounds, packed for shipment. *Macdonald & Co.*

. . . for more details, circle No. 195 on postcard

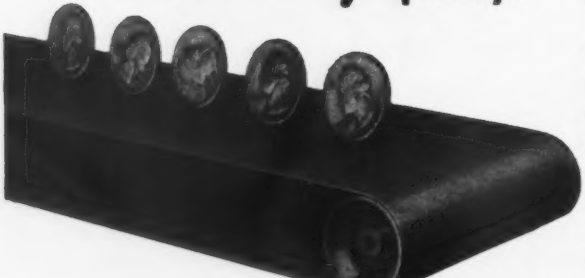
HINGED-COVER WIREWAY
. . . for limited space, tricky contours

A hinged cover permitting lay-in wiring through every length and fitting, is featured in a wireway useful where space is limited and building contours complicated. The hinged-cover opening over the entire length of the run eliminates the customary threading of the conductor through collars. Easily and quickly installed, the unit has a hook-and-slot arrangement for fast assembly and the lay-in design assures speedy wiring. The wireway comes in 1 to 5-ft. lengths in 3 sizes—4, 6, and 8 in. square. Standardized fittings are available. *Distribution Assemblies Dept., General Electric Co.*

. . . for more details, circle No. 196 on postcard

SMOOTH TRAVEL right down the line...

with *Barry* pulleys



WRITE FOR NEW CATALOG TODAY!

Packed with information on all types of Barry solid and split steel conveyor pulleys and Barry lagged pulleys. Send for your free copy now!

It's a fact! Smoother and better *all around* conveyor performance is yours when Barry Pulleys are part of the system — whether general, package, portable or production line. And there's good reason . . .

Barry Conveyor Pulleys, with regular or "Quick Detachable" taper bushed hubs, absorb the repeated demands of heaviest work loads without wear and tear on crowns, bearings and other components! Also, *electric welded* end discs keep out moisture and dirt which shorten the service life of other pulleys.

Because Barry Pulleys mount up closer, they form a truly inflexible assembly. And because their design permits ideal lateral alignment, they fit on shafts properly and firmly, without working loose.

Whatever the conveyor application, remember: *better performance records ride on Barry Pulleys!*

***Barry* PULLEYS**
are another quality product of...

R. & J. Dick COMPANY, INC.
PASSAIC, NEW JERSEY

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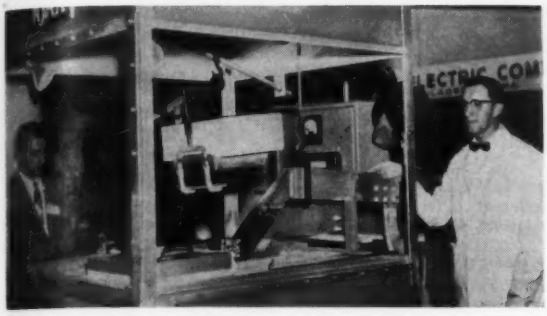
5276 Atlantic Blvd.	510 Bryant St.	307 Maritime Bldg.
LOgan 8-4014	SUtter 1-1341	MUtual 1922

. . . for more details, circle No. 64 on Reader Service Postcard

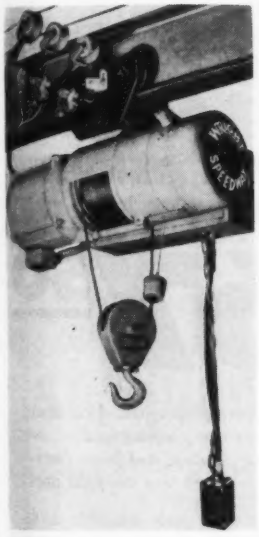
SALT BATH FURNACE
. . . with removable submerged electrodes



Submerged electrodes that can be changed in less than an hour are features in the Type R salt bath furnace design. Replacement is accomplished by simply lifting a tile that lies over each pair of electrodes sealing off air and preventing oxidation attack. A pot life of up to ten years, plus low production time loss and less labor requirements for the replacement process, will save money for you, according to the manufacturers. *Ajax Electric Co.*

. . . for more details, circle No. 197 on postcard

ELECTRIC HOIST
. . . with fractional hp. 1,800/450 rpm. motors



This two-speed Wright Speedway electric hoist, equipped with fractional horsepower 1,800/450 rpm. motors, provides a fast lifting and lowering speed and a slow, ¼ normal speed. According to the manufacturer, the hoist parallels the sensitivity of control of air hoists without some of their disadvantages, and saves 50% in maintenance costs over other types of small electric hoists. Side and end covers of the hoists can be quickly unscrewed for servicing of exposed parts, while two adjustments of a set screw are all that is required to compensate for brake lining wear. The Frame 1 line, of which this hoist is a part, is available with parallel mounting, cross mounting, hook, rigid or bolt mounting, and utilizes totally enclosed NEMA specification motors for operation on a-c or d-c. *American Chain & Cable Co., Inc.*

. . . for more details, circle No. 198 on postcard

TITANIUM DESCALING PROCESS
. . . has no adverse physical, chemical effects

A chemical process for descaling titanium and its alloys, this method requires relatively low temperatures, results in low metal loss and is suitably inhibited to avoid hydrogen pickup and resultant hydrogen embrittlement. Requiring only two immersion steps and two rinsing steps, it gives 100% chemical cleanliness without warping thin gauge material, and neither causes salt entrapment in fraying edges, creates fire hazards nor adversely alters physical characteristics or smoothness of alloys. *Turco Products, Inc.*

. . . for more details, circle No. 199 on postcard

Dayton & Bakewell
SINCE 1926

PRODUCTION EQUIPMENT SPECIALISTS

TO SOUTHERN CALIFORNIA INDUSTRY

● EXPERIENCE The *right* equipment for the job can make the difference between average and top efficiency . . . and a BIG difference in costs. D&B's long EXPERIENCE . . . more than 30 years of specialized service in recommending and supplying high quality production equipment . . . has helped hundreds of plants and shops in Southern California to profit from peak production performance at lowest costs.

Try us the next time you have a production problem involving machine tools or sheet metal machinery. Solving tough ones is our specialty. D&B's all-important EXPERIENCE is yours for the asking, at no extra cost, just call . . .

TRinity 7466

Dayton & Bakewell
SINCE 1926

● ONSRUD ROUTER

Radial Arm up to 124"
WITH POWER ASSIST

- Stroke on motor slide increased 25% to mill those deep pockets and cavities.
- Power Assist—same as power steering on your car—eliminates operator fatigue and increases production.
- Now possible to make 1" cuts and deeper, with ease, due to Power Assist. Previous manual operation was limited to ⅝" cuts.

Let us show you one of these remarkable new Onsrud Routers in operation, or phone for bulletins and prices.

TRinity 7466

DEPT. I-27, 1939 SANTA FE AVENUE
LOS ANGELES 21, CALIF.

Dayton & Bakewell
SINCE 1926

. . . for more details, circle No. 65 on Reader Service Postcard

NEW OAKITE CLEANERS GIVE YOU MORE FOR YOUR PAINT-PREPARATION DOLLAR

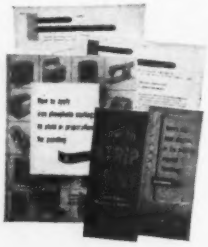
Does your trouble chart show that you need better cleaners, strippers or surface conditioners?

- ☐ Too many operations needed to prepare steel for painting. See **1** below.
- ☐ Streaky stains or powdery residues on steel parts being stripped for repainting. See **2.**
- ☐ Phosphating process shows poor results in salt spray tests. See **3.**

FREE Ask for booklets or bulletins on:

1 Oakite Compound No. 131
2 Oakite Rustripper
3 Oakite CrysCoat No. 89

Write to Oakite Products, Inc., 1001 E. First St., Los Angeles, or 681 Market St., San Francisco, Calif.



OAKITE

Technical Service Representatives in Principal Cities of U.S. and Canada

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WHICH V-BELT *is best for you?*

If the correct size of endless V-Belt is not readily available, or if you have to tear down machinery to install, then the best belt to use is open-end V-Belting fastened with

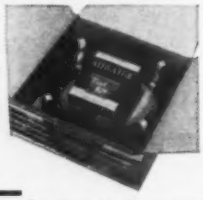
ALLIGATOR **V-BELT FASTENERS**

★ In this way you can make up V-Belts in *any length* to fit *any drive* the fast economical way—V-Belts that perform exceptionally well.

★ In contrast to link-type belts these ALLIGATOR fastened V-Belts have just *one* strong joint . . . *stretch and follow-up maintenance are reduced to a minimum.*

ALLIGATOR **INTRODUCTORY V-BELT DRIVE UNITS**

contain V-Belting, Fasteners and Tools —everything you need in one compact package to make up V-Belts quickly. Available in sizes A, B, C & D.



Ask for Bulletins V-215 and V-216
Order From Your Distributor

FLEXIBLE STEEL LACING COMPANY
4642 Lexington Street, Chicago 44, Illinois

. . . for more details, circle No. 67 on Reader Service Postcard

LUMINOUS CEILINGS
. . . give even light, eliminating glare

Ceiling area just before "Acusti-Luminus Ceiling" was installed in industrial dining room, top. Completed installation, bottom.

Designed to provide over-all glareless, shadowless illumination, these ceilings diffuse lighting over an entire ceiling area giving uniform distribution. Before and after pictures show the changed appearance effected by the process which uses a translucent, corrugated plastic ceiling suspended below rows of fluorescent or slimline light sources. Easily removable for washing or access to light fixtures and valves, the plastic can be installed below sprinkler heads, making possible more attractive decorative effects at lower costs. The ceilings come in types such as electric, module, louvers, acrylic and the Acusti-Luminus that provides acoustical correction by perforated steel baffles with Fiberglas absorption pads. *Luminous Ceilings, Inc.* **. . . for more details, circle No. 200 on postcard**

LOW-COST DIP COATINGS
. . . for zinc and cadmium plate

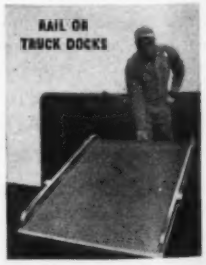
Suitable for hand-operated still tanks, barrels and fully automatic machines are four Unichrome dip compounds for

DO YOU KNOW?

YOU CAN BUY A GENUINE MAGLINER MAGNESIUM DOCK BOARD *for as little as* $67.50

IT'S A FACT—a standard Magliner magnesium dock board costs so little when you consider its many advantages . . . *one man handling, greater safety, faster loading, and lower costs*—that it will pay you big dividends to try one on your dock.

Magliner magnesium dock boards are now available in 48 standard sizes. They're light, strong, tough—*only a third the weight of steel equipment!* Patented, adjustable drop-lock anchors boards securely for varying truck height differences and dock-to-carrier spans. TRY A MAGLINER dock board. Immediate shipment from factory stock.



MagLiner MAGNESIUM DOCK BOARDS

Write for Bulletin DB-203.

MAGLINE INC., P. O. BOX 52, PINCONNING, MICH.

Canadian Factory: Magline of Canada, Ltd., Renfrew, Ontario

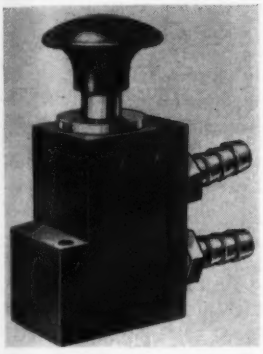
Air Mac, Inc., 3838 4th Ave., South, Seattle 4, Wash.; 313 N. Grandview, Yakima, Wash.; East 3710 Trent Ave., P. O. Box 1125, Spokane 10, Wash.; 1111 S. E. Grand, Portland 14, Ore.; 1003 Washington Blvd., Tacoma 2, Wash.; **All Bearing Sales & Service Co.,** 602 Fulton St., Fresno, Calif.; **W. T. Billard, Inc.,** 734 E. Third St., Los Angeles 13, Calif.; **Colson Equipment & Supply Co.,** 1317 Willow St., Los Angeles, Calif.; **Equipment Supply Co.,** 16 Post Office Pl., Salt Lake City 1, Utah; **E. D. Flournoy Co.,** 217 6th St., S. W., Albuquerque, N. M.; **Homerslag Equipment, Inc.,** 110 Freeway Blvd., South San Francisco, Calif.; **Kistler Industrial Service;** 902 S. Central Ave., P. O. Box 1204, Phoenix, Ariz.; **Plant Equipment Co.,** 1400 Market, Denver 2, Colo.; **Winn Supply Co.,** 256 7th Ave., P. O. Box 1709, San Diego 12, Calif.; **Yale & Towne Mfg. Co.,** 6027 Whittier Blvd., Los Angeles 22, Calif.

. . . for more details, circle No. 68 on Reader Service Postcard

finish-coating in zinc and cadmium plating operations. Dry Dip Compound 1085, and its liquid counterpart, 1090, are especially suited for zinc-plated parts plated in bulk—such as conduit and steel strip—and products subject to outdoor exposure. Compound 1084, especially for cadmium plating but also employed for zinc, provides an economical corrosion-resistant finish for thin plated bulk work in either hand-operated or automatic lines. Dip compound 99 is a liquid version of 1084, possessing the same characteristics. *Metal & Thermit Corp.*

. . . for more details, circle No. 201 on postcard

QUICK-ACTION VALVES . . . have direct air passages



Large and direct air passages give these valves their quick action, according to the manufacturer, while spool type plunger construction assures that increased effort is not needed to actuate the valves when air line pressure increases. To maintain compact size and direct air passages, air inlets and outlets are close together, but hose nipples are at an angle to accommodate quick connectors and large diameter air hose. Valve bodies are machined from aluminum, while plungers are chrome plated steel and caps, plugs and hose nipples are brass. Valves are available in either spring return or self-locking types, normally closed or normally open. *Mead Specialties Co.*

. . . for more details, circle No. 202 on postcard

short runs on packaging at "quantity costs"

can your present packaging methods match this record?

Where the problem of shipping small quantities of a variety of products or "sometimes" items requires the special purchase of packaging materials, the establishment of a temporary packaging line or where infrequently used shipping space could be turned to profitable production, SPEC may well be the answer. Because we serve 300 and more manufacturers, we buy quantities of packaging supplies of almost any conceivable nature. This can mean "quantity costs" on your short-run orders. Remember, SPEC'S production is packaging—100%. If we can be of service, may we visit and discuss your packaging with you today?

We package everything . . . for shipment everywhere

SPEC Packaging

Call SPEC at ST 7-5571
or PO 2-2128

SPECIFICATION PACKAGING ENGINEERING CORP.
6869 Tujunga Avenue
North Hollywood, California

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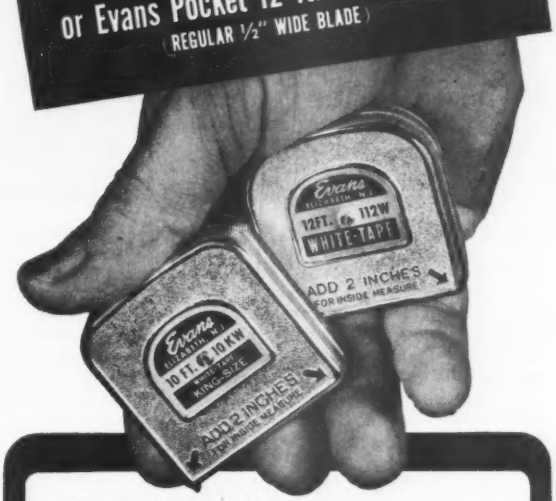
TO PURCHASING AGENTS ONLY!

FREE! Your Choice . . .
Evans KING SIZE 10-ft. White-Tape
(EXTRA-WIDE BLADE)
or Evans Pocket 12-ft. White-Tape
(REGULAR ½" WIDE BLADE)



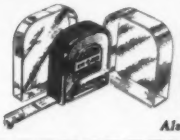
Attention Purchasing Agents:
We make this startling offer to introduce your company to Evans' superior King-Size and Pocket White-Tapes, the finest measuring tapes manufactured.
Simply fill in the coupon below and we'll send you, absolutely free and without any obligation, your choice of either our King-Size 10-ft. ($2.39 retail) or Pocket 12-ft. White-Tape ($1.89 retail)! (Offer limited to one tape per purchasing agent.)
We feel that once you try Evans Tapes, you'll never buy another brand. Here's why:

EVANS KING-SIZE
10-ft. ¾" Wide Steel Tape Stands Up Straight for Easy One-Man Measurements.

The 33% wider blade (full ¾") stays straight up—will not bend when making measurements. Chrome plated zinc die-cast case. Free belt clip for handy carrying and Free Tenite Utility Case. Self-adjusting sliding hook for accurate inside-outside measuring.
Also available in 6, 8, 12-ft. lengths.

All EVANS Tapes are marked so your men don't have to figure!

EVANS 12-ft. Pocket WHITE-TAPE

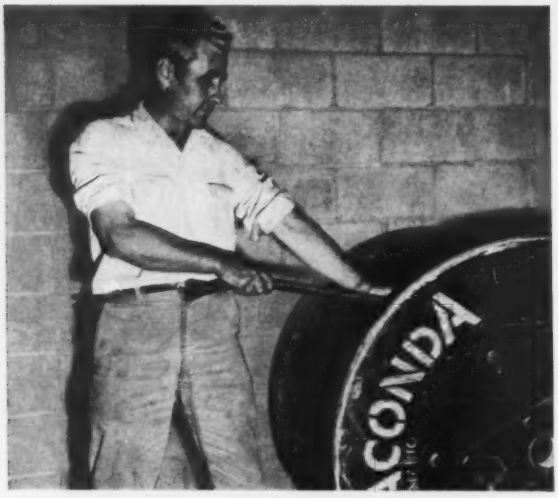


Measures a full 12 feet — eliminates adding two measurements as with shorter tapes. Regular ½" wide blade. Chrome plated zinc die-cast case. Self-adjusting sliding hook for 100% accurate inside or outside measurements. Free transparent Tenite Utility Case.
Also available in 6, 8, and 10-ft. lengths.

Evans RULE CO., Dept. 165 Elizabeth, N.J.
Please send me free sample of (check one)
☐ King-Size 10-ft. Steel Tape ☐ Pocket 12-ft. White-Tape
☐ Send catalog page on Evans Tapes with custom nameplates for gifts to our customers carrying our advertising message.
My two sources of supply for steel tapes are:
1)_____
2)_____
Name_____Title_____
Company_____
Address_____
City_____Zone____State_____

For quick, efficient service call your Industrial Distributor. He is your most economical source of supply.

. . . for more details, circle No. 70 on Reader Service Postcard



ALL-PURPOSE DURASHEATH CUTS COST

Anaconda's neoprene-jacketed Durasheath* cable cuts installation costs because it can be installed in ducts, buried, aerially or any combination of these *in one run—with minimum splicing.* It reduces maintenance and replacement costs because its rugged jacket resists abrasion, moisture, corrosive chemicals and oils that shorten ordinary cable life. Available in all sizes, single and multiple conductor, copper or aluminum, 600 to 15,000 volts. For full information, write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 57359

ANACONDA®

*Reg. U.S. Pat. Off.

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GAR-BRO WHEELS

FOR ALL INDUSTRIAL APPLICATIONS

26
TYPES & SIZES

Mfd. by:
EQUIPMENT ENGINEERING SERVICE GAR-BRO

WHEEL TYPES: Drop Center, Lug Base, Disc, Demountable.
WHEEL DIAMETERS: 21", 20", 18", 17", 16", 15", 12", 10", 8", 6".
BEARINGS: Tapered roller, straight roller or ball.
TIRES: Pneumatic or cushion—all standard sizes.

Available with or without tires.
Write for catalog.

GAR-BRO WHEEL COMPANY

Division of Garlinghouse Bros.
2415 E. Washington Blvd., Los Angeles 21, Calif.

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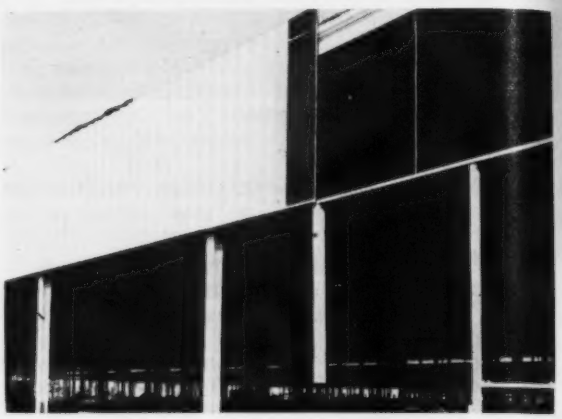
ACOUSTICAL SIDEWALL PANELS
. . . a single material for sound control



Announced as a single-material answer to many industrial sound control problems is a new adaption for wood-fiber insulating board. Made of long-strand wood fibers impregnated with an inorganic hydraulic binder and compressed to 2 to 3-in. thickness, the sidewall panels come in 30-in. widths, sized from 4 to 10 ft., with longer lengths available by special order. The textured wood surface has a decorative shadowline groove on each panel-edge, plus tongue and groove edges to assure tight fits and smooth surfaces. The panels can be mounted in various ways either inside or outside framing girts, and 15-lb. felt backing provides resistance against breathing. *Tectum Corporation.*

. . . for more details, circle No. 203 on postcard

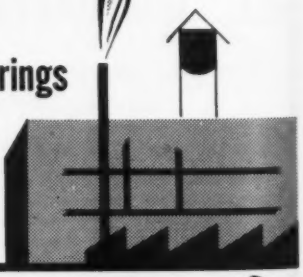
we maintain

COMPLETE STOCKS

of

Power Transmission Equipment, Ball & Roller Bearings

5 Strategic locations to serve you



Serving the Southwest since 1919

EDWARD D. MALTBY CO.

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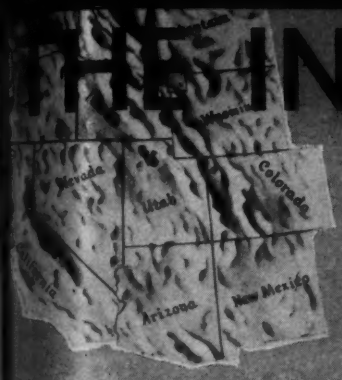

THE INDUSTRIAL WEST ON ITS WAY

plants • production • distribution • personnel

GUIDELINES — FEBRUARY 1957

- **WEST'S METALS PRODUCTION GETS TWO BIG BOOSTS:** Bethlehem Pacific will expand its Seattle plant capacity by 70% at cost of $25,000,000. When completed 2½ to 3 years from now, expansion will increase plant's capacity from presently produced 246,000 ingot tons to 420,000 tons. Completion of this project will mark a **doubling of Bethlehem Pacific's Western steel capacity** since World War II (a time when the Western industrial area was scheduled to fold, in a lot of people's books.)

  A new plant for production of primary aluminum is being established through a $1,000,000 conversion of Pacific Electric Railway shop buildings by **Reynolds Metals in Torrance, Calif.** Scheduled to employ 1,000 persons, the plant should be in operation this summer.

- **TRAINING IN NUCLEAR REACTOR OPERATION AND APPLICATION** will get under way soon for anyone who thinks atomic power may fit in his plant, power utility, hospital or educational facility. Aerojet-General has announced that it will start a one-week training program to permit executive and management personnel to obtain a "close-up" look at nuclear reactors at its San Ramon, Calif., (just east of Oakland) plant. Object is to give participants a **basis on which to make intelligent decisions as to whether they can really use atomic power or not.** Aerojet offers complete detailed information about the course—and we'll see that you get it if you're interested and **circle Reader Service Postcard number 300 on page 69.**

  More nuclear research will take place in a $1,200,000 experimental building being built at General Atomic Div. of General Dynamics Corp.'s nuclear research lab in San Diego.

- **$4,000,000 GUIDED MISSILE PLANS HAVE BEEN FIRMED UP** by Douglas for its Thor intermediate range ballistic missile development project near Sacramento, Calif. Finalization of the plans came after award of an **Air Force contract for $1,305,500** to build the facility. Douglas is throwing in as much as $3,000,000 of its own on the project, located adjacent to Aerojet-General's rocket motor test grounds at Nimbus.

  More missile testing will be conducted by Lockheed at a $1,000,000 site to be developed in the Santa Cruz mountains near Lockheed's Sunnyvale, Calif., Missile Systems division. Facility will employ about 300 persons. No actual missile launching is scheduled for the site.

  And Norton Co. has set up a Rokide ceramic spray coating facility in its Santa Clara, Calif., plant that represents another system developed for rocket and jet engine purposes, that **should also prove helpful to manufacturers of other equipment operating at high temperatures.** Surfaces protected by the Norton-developed coating process reportedly have excellent wear-resistant qualities.

- **GENERAL MOTORS SAYS "WAIT AWHILE"; BOEING IS FORCED INTO "NO DICE" DECISION, IN BAY AREA:** A screeching halt was called on General Motors' progress toward finalization of plans for its planned assembly plant in Sunnyvale, Calif. Plant was originally scheduled to be completed in time to produce 1959 models. **No word on the length of postponement yet.**

  Boeing Airplane has abandoned plans for opening production facilities for its **Bomarc guided missile in the San Francisco Bay Area.** Options previously announced on Richmond Ford plant and acreage for proposed construction of plant facilities have expired. Possibility of handling increased Bomarc production at Seattle, Wash., existing missile facilities is being considered.

— News details on following pages —

THE INDUSTRIAL WEST ON ITS WAY
is a special monthly feature of . . .

Western Industry

. . . serving plant operating executives in the nation's fastest growing region.
609 Mission St., San Francisco 5, Calif.

Three big ones for Lockheed missile

Lockheed Aircraft Corp. has recently announced three expansion moves for its missiles systems division in the Northern California area.

Most recent is the agreement to lease from Prudential Insurance Co. $14,000,000 worth of office, manufacturing and laboratory facilities that the insurance firm will build in Sunnyvale and at Lockheed's research laboratories in Stanford Industrial Park, Palo Alto, Calif. Lockheed now owns the Sunnyvale property of 275 acres, to which Prudential will get the title for later lease to the aircraft company.

Also announced recently was the purchase of 2,600 acres of heavily-forested land in the Santa Cruz Mountains on which Lockheed will set up the country's largest electronics center. Division scientists and engineers will use test facilities there to evaluate hazardous and noise-producing parts of advanced new missiles. Preliminary work, including building access roads in the rugged area, is to begin soon and by mid-year construction work will get under way.

Sylvania will add to microwave tube lab

Greater facilities for research and development will be provided by an 18,000-sq. ft. addition to Sylvania Electric Product Inc.'s microwave tube laboratory in Mountain View, Calif. The addition will permit a complete separation of production and development additions, with the new facility earmarked for the engineering group, expected to reach 125 persons. The facility features a 100 ft. sq. area for eight project groups, plus a chemistry laboratory, cathode room, a spot-welding area and a special room for hydrogen furnaces. Recently Sylvania purchased an adjacent site of 13½ acres for future expansion and announced realignment of the laboratory's top engineering executives.

Gavitt Wire & Cable schedules So. Calif. unit

Gavitt Wire & Cable Co., Brookfield, Mass., has announced imminent construction of a new factory unit at Escondido, Calif., where a $750,000 facility of 35,000 sq. ft. will be built. The Gavitt firm is a division of the American Hard Rubber Co., New York.

PRODUCTION WILL GO UP 400% and employment 200% with new Bone Engineering plant.

Bone Engineering to expand with new plant

Bone Engineering Corp. anticipates a 400% increase in production capacity and over 200% increase in employee requirements with addition of a new building adjacent to its plant at 701 W. Broadway, Glendale, Calif. The additional 20,000 sq. ft. provided by the new building will house latest investment casting equipment and include a new melting method which employs a 100-lb. furnace. The production system integrates machining, tooling and pattern marking with investment casting facilities, providing a complete production and finishing process. This marks the third such expansion for Bone and an equal size project is anticipated soon.

St. Regis Paper buys J. Neils Lumber Co.

Purchase of the J. Neils Lumber Co. and plans to build a Western Montana pulp and paper mill were announced recently by St. Regis Paper Co. The purchase involves about 200,000 acres of timberland near the Kootenai River in Montana and nearly 100,000 acres in the Klickitat River in southern Washington. Working radius of the purchased lands embraces some 15,000,000,000 bd. ft. on federal, state and county lands, as well as in the Yakima Indian Reservation. The Neils Co.'s sawmills are at Libby and Troy, Mont., and Klickitat, Wash. St. Regis plans installation of barkers and chippers at each of these mills. Reslulting wood chips will go to St. Regis mill in Tacoma, Wash., for processing until the projected Montana plant is in operation.

Eutectic Welding opens two Western warehouses

Warehouse-service centers in Berkeley, Calif., and Phoenix, Ariz., will expedite delivery of Eutectic Welding Alloys Corp. products in the West. The California center is located at 1108 Blake St., Berkeley, while the similar Phoenix facility is at 1402-1414 S. Seventh St. The two new centers will be headquarters for Eutectic district engineers who provide shop-to-shop advisory service and demonstrates latest welding techniques being developed by Eutectic's research and development laboratories.

Bethlehem Seattle plant to grow

Bethlehem Pacific Coast Steel Corp. will increase capacity of its Seattle plant by about 70% in the next two or three years. On completion of its $25,000,000 expansion plan, the plant's capacity will go from present 246,000 tons yearly to 420,000 ingot tons. Work is already under way on a building for two 100-ton capacity electric furnaces, replacing five present open hearth furnaces. The expansion will also include a new rolling mill instead of the present 12-in. bar mill, revamping of the current 22-in. mill to produce larger size structural sections and plates, and a new 32-in. blooming mill for break-down of large ingots into usable rolling mill size.

Garrett Corp. builds two Phoenix additions

Construction began in January for two new Phoenix, Ariz., facilities by divisions of the Garrett Corp. The first, for AiResearch Mfg. Co., is a 40,000-sq. ft. manufacturing-office building to house 500 workers engaged in its valve and electronic business. On an eight-acre tract north of the AiResearch test facility on the former Washington Park race track, the one-story concrete block structure will house 24,000 sq. ft. of office area and 16,000 sq. ft. for assembly and stores. Completion is scheduled for May.

The Garrett Supply Division's $250,000 building, also to be finished

in May, is on a five-acre site at 29th Drive and Thomas Road. First structure in the newly-zoned Industrial Park area of northwest Phoenix, it is a single-story building of 25,000 sq. ft., with 5,500 sq. ft. for office use and the remainder for warehousing. Garrett supply distributes industrial tools and supplies, and provides engineering services for Southwest industry.

$4,000,000 construction by Douglas in Sacramento area

Douglas Aircraft Co. has revealed plans for a $4,000,000 construction program in the Sacramento, Calif., area during 1957. The announcement follows award of an Air Force contract for $1,305,500 to build facilities in support of the USAF guided missile program. The additional money outlay by Douglas will go for improvements to the firm's 1700-acre Sacramento site where land clearance, roads and construction of missile test stands, assembly and hangars, a cafeteria, fire and plant protection building, and a control building are scheduled. The new facility, which adjoins Aerojet-General rocket motor test grounds near Nimbus, will be used first for development of the Thor intermediate range ballistic missile, but testing will not include missile launching.

Norton Co. opens Rokide lab in Santa Clara

Santa Clara, Calif., is the site of a laboratory opened in January by Norton Co., for the purpose of demonstrating its Rokide ceramic spray coatings. Equipped with three spray guns and auxiliary equipment, the laboratory will duplicate similar facilities at Norton's main plant in Worcester, Mass. Ceramic spray coatings for protecting surfaces exposed to ultra-high temperatures, as in rockets and jet engines, will be used on test pieces at the Santa Clara lab, where Norton also can train plant operators for setting up their own coating departments.

Munnell & Sherrill open house in Portland

An open house celebration, attended by some 500 persons, was held by Munnell & Sherrill, Inc., upon the opening of a new office building in Portland. The facility provides 25,000 sq. ft. of main floor warehouse and display space, plus a large balcony office area and an off-street parking lot. Distributor of Worthington-Goodyear V-belts and Worthington's Q-D sheaves, mill and logging equipment, the firm has branch offices in Eugene, Ore., and Arcata and Ukia, Calif.

Nuclear reactor training program offered

First training program in which participants will actually handle nuclear controls and reactor hardware, with opportunity to participate in assembling a reactor and seeing it "go critical," has been announced by officials of Aerojet-General Nucleonics in San Ramon near Oakland, Calif. *Robert Mainhardt*, general manager, and *Dr. A. T. Biehl*, technical director of the firm which designed and produced the world's first mass-produced reactor, the AGN 201, for training and research, have announced they are making a one-week training program available to industry, colleges and universities, the medical field and power utilities field. Those attending will handle control rods and fuel elements as well as receive instruction in nuclear reactor theory, operations and licensing requirements.

The project has two purposes: first, to afford executive management personnel a "close-up" look at the nuclear reactor field so that intelligent decisions may be made on companies' participation and use of reactors, and second, to give each qualified participant actual reactor operation experience plus theoretical instruction in the nuclear technology field.

Course instructors will be from Aero-jet General's technical staff. Basis of instruction will be lectures, discussions and actual operation on a series of reactor experiments on the AGN 201. Special consideration will be given those who wish to perform experiments relative to their industry problems. Completely devoid of security requirements and government classifications, the program is open to persons from other countries. Aerojet-General Nucleonics will give complete information on request.

$5,000,000 Calif. plant for SPS

A highly functional, multi-product manufacturing unit capable of switching easily from one product to another is the $5,000,000 "showcase" plant to be built by Standard Pressed Steel Co. in Santa Ana, Calif. Scheduled for early 1958 completion, the one-story 280,000-sq. ft. building will employ some 500 people in producing precision industrial and aircraft fasteners, related specialty items and pressed steel shop equipment.

The colorful exterior of the facility will consist mainly of tinted green aluminum curtain walls with continuous ribbon window sash, above a 4-ft. painted concrete foundation erected by the tilt-slab method. The two-in. thick wall panels—each a 10 by 6-ft. Fiberglas section between ribbed aluminum sheets—will give insulation equivalent to 19 in. of masonry, afford simplified erection and facilitate future expansion.

The structural steel skeleton of the plant gives wide-spaced columns, providing maximum free floor space and lay-out flexibility. Other features are 60-ft. production bays, a 600-ft. receiving platform with a 20-ton overhead crane, and an unusually high ceiling. Straight line production pattern in the plant will simplify manufacture of varied products of different SPS divisions simultaneously, and also facilitate product changeover in any one area.

Waldorf Paper plans $6,000,000 Montana mill

A multimillion dollar pulp mill that is expected to be in production next fall has been begun by Waldorf Paper Products Co., near Missoula, Mont. First mill of its kind in the state, the plant's first buildings will be for handling and storing of wood chips. The kraft type, sulphate-process plant will be of modern design to keep air and water pollution to a minimum, with maximum recovery of all chemicals and solids, Waldorf officials said. Plus benefits of the construction work and large steady employment rolls, the pulp plant will pay out about $1,500,000 yearly to the lumber industry for chips to make the pulp. The mill site is on 600 acres on Clark Fork River.

New Anaconda plant will quadruple facilities

Expansion plans at Orange, Calif., by Anaconda Wire & Cable will more than double present production facilities. A principal structure of more than 500,000 sq. ft. and several auxiliary buildings are planned for a recently-optioned 85-acre site. Expected total outlay for the new plant will exceed $5,000,000.

Sarco moves into larger S. F. quarters

Sarco Company, Inc., has moved its San Francisco office and warehouse to larger quarters. New address, according to *J. S. Spear*, branch manager, is 1485 Bayshore Blvd., San Francisco 24.

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TWICE ITS FORMER FLOOR SPACE is provided Brodhead Steel Products in its new $150,000 plant.

Brodhead shifts to South San Francisco site

Doubled floor space for Brodhead Steel Products Co. is provided by recent construction of a $150,000 plant at 143 South Linden Ave. in South San Francisco. Features of the new facility are plastic skylights over the shop area, overhead crane material handling equipment and methods, and new cutting and welding equipment. Shipping and receiving procedures have also been improved and combine with a more centralized location to expedite product delivery. Formerly at 17th and Wisconsin Sts., in San Francisco, the Brodhead firm fabricates and distributes steel grating produced by Blaw-Knox Co., Pittsburgh, Penna.

Martin Brothers moves food crate headquarters

Martin Brothers Timber & Container Products Corp. announces division of its operations into two units, with the food crate division headquartered in San Francisco at 100 Bush St. Industrial division location will continue at the firm's general office in Whittier, Calif. *Edward E. Johnson*, general manager of the wirebound box and crate manufacturing firm, who will move to San Francisco, said a Southern California sales manager will be appointed shortly. Another aspect of the company's expansion was the July purchase of Cabco Wirebound Box Mfg. facilities and operations.

American Brass named Summerill distributor

The American Brass and Copper Co., Oakland, has been named distributor for Hydraluster hydraulic steel tubing, made by Summerill Tubing Co,. Carnegie, Penna. The announcement was made by Van D. Clothier, Inc., San Francisco, Summerill's West Coast sales agent.

Gas generator for Calstrip nears completion

Calstrip Steel Corp. of Los Angeles will complete this month its installation of a new gas atmosphere generator for production of non-oxidizing atmospheres for use in a line of bright annealing furnaces. With the new facility, Calstrip will be able to produce improved quality steel for spring steel and alloy steel strip, rolled on the new Sendzimir mill installed by the firm in 1955. Formerly restricted to output of low carbon steel strip and aluminum coiled sheet, the mill, by addition of the new generator, can make available superior quality strip in spring and alloy steel grades.

Kroehler Furniture plans factory near Oakland

First major industrial enterprise in the newly-incorporated city of Fremont, near Oakland, Calif., will be a $2,000,000 furniture plant planned by Kroehler Mfg. Co., of Naperville, Ill. Scheduled for completion by the end of 1957, the factory will be on 10-acre site and expected employment is 200 workers. Three times the size of Kroehler's plant at Pittsburg, Calif., the new facility will turn out all types of upholstered chairs and sofas for West Coast markets.

Two new plants slated at Modesto, Calif.

Modesto, Calif., has new plants under construction by Moore Business Forms, Inc., and California Vegetable Concentrates, Inc. At Moore's 24,000-sq. ft. plant, the product will be Flatpakit register stationery. The vegetable concentrate firm is locating its 65,000-sq. ft. plant in the Tidewater Southern Railway's 226-acre industrial subdivision in south Modesto.

. . . for more details, adv. opp. pg., circle No. 75 on Reader Service Postcard ➡

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MORE EQUIPMENT CAN BE STOCKED in Degen-Fiege's newly-opened Los Angeles headquarters.

Degen-Fiege Co. moves to larger L. A. quarters

In the heart of Los Angeles' industrial district is the new plant of Degen-Fiege Co., distributor of industrial and power transmission supplies. The new facility at 4559 East Sheila St., provides more floor area and room for additional equipment through rearrangement of stock. Several hundred industrial purchasing agents and executives attended an open house Degen-Fiege held to celebrate the new plant's opening.

General Motors delays construction in California

General Motors' plans for construction of a huge new Sunnyvale, Calif., plant have slowed down, according to company spokesman. The factory, for which grading on the 21-acre tract was to have begun soon, was designed to assemble 100,000 cars yearly, with capital investment set at about $700.-000,000 this year. The original timetable called for the 1,250,000-sq. ft. plant to begin production with 1959 models. Buicks, Oldsmobiles and Pontiacs were scheduled for assembly at the California plant. Also delayed are plans for a Chevrolet car and truck assembly plant near Cleveland, Ohio.

West's first graphite and carbon plant to start soon

The carbon and synthetic graphite plant of the Crescent Carbon Corp., under construction near Lancaster, Calif., is near time of initial testing and operation for manufacture of electrodes, anodes, electrolytic anodes and other products. First such plant to be built in the West, the multi-million dollar, completely equipped factory will have a technical staff with modern laboratory facilities to work with Western plants on production, development and research problems. The graphitizing process will take place in temperatures about 5.000 deg.

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F., one of industry's highest temperature processes. Petroleum coke and pitch will be principal raw materials used in the manufacturing. *Dr. N. K. Anderson*, president, heads the staff and sales will be handled by the E. S. Gilmore Co. of Los Angeles, with representation in 11 Western states.

Big alkylation unit for Shell in Wash.

Plans for a multimillion dollar alkylation unit at Anacortes, Wash., have been announced by Shell Oil Co. *R. C. Barton*, manager of the Anacortes refinery, said the new unit will enable Shell to produce about 800,000 bbl. a day of 115/145 grade aviation gasoline. The unit, slated for mid-1958 completion, will use a process in which olefins and isobutane are mixed and reacted in the presence of the sulfuric acid catalyst under refrigeration to produce crude alkylate. The reaction product is then processed in fractionating columns to produce 2,400 bbl. daily of crude alkylate for blending into aviation fuel.

Kaiser buys U. S. Rubber's wire and cable business

Kaiser Aluminum and Chemical Corp. has announced purchase, effective Feb. 1, of the United States Rubber Co.'s wire and cable business, including the plant at Bristol, R. I., its inventories and personnel, and U. S. Rubber's nationwide sales organization, and distributors network. By the acquisition Kaiser, producer of covered aluminum electrical conductor and bare aluminum wire and cable, will broaden its service by adding many different types of insulated conductors, in both aluminum and copper. Kaiser will maintain benefits similar to those of U. S. Rubber for the 1,400 employees. The Bristol plant is on an 18-acre site with 654,000 sq. ft. of floor space.

Orchard Paper Co. buys firm in L. A.

Orchard Paper Co., St. Louis, has announced recent purchase of properties and equipment of the Associated Paper Converting Corp. of Los Angeles, bag and printed roll specialty manufacturer. The new owners plan expansion of Associated's plants and warehousing. Head of the Portland sales office, newly set up by Orchard, is *L. Clarke Middleton*, who will direct activities in Oregon, Washington, Utah and Idaho handling products of the Orchard firm and its subsidiary, the Pacquette River Paper Corp. of Potsdam, N. Y. Formerly with Carter Rice & Co. of Oregon, Middleton has headquarters at 11730 Southeast Main St., Portland 16.

New division set up by Fluor Products

Fluor Products Co., a division of The Fluor Corp. Ltd., has formed a separate division for design, prefabrication and marketing of a complete line of cooling towers for the air conditioning and refrigeration industry. Volume production on the first of four basic models is now under way at the company's 155-acre mill in Santa Rosa, Calif. This model, designed for central station air conditioning and refrigeration systems in plants, is furnished in a multiplicity of cell sizes to fit all architectural requirements.

General Dynamics begins $1,200,000 laboratory

General Atomic Division of General Dynamics Corp. has begun construction of a $1,200,000 building in San Diego, Calif., first of four for a nuclear research laboratory. The 44,000-sq. ft. facility slated for mid-1957 completion is on a 300-acre site and will house an atomic reactor and other units.

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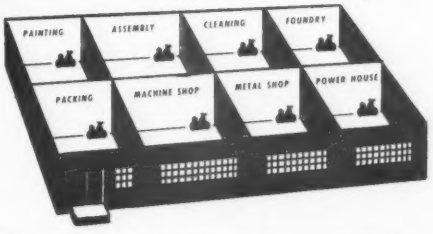

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Cement production gets boost in NW

Oregon Portland Cement Company has just completed an expansion and modernization program totaling more than $6,000,000 and giving its plants at Oswego and Lime, Ore., an annual capacity of more 3,000,000 bbl.

The expansion plan, under way for more than a year, has increased Oswego plant production more than 60%, providing a new kiln, grinding equipment, cement coolers, stack and extensive dust collecting system, and a modern packing and loading department, with an approximate expenditure of $3,100,000. At Lime, production has been more than doubled with the entire plant modernized and enlarged.

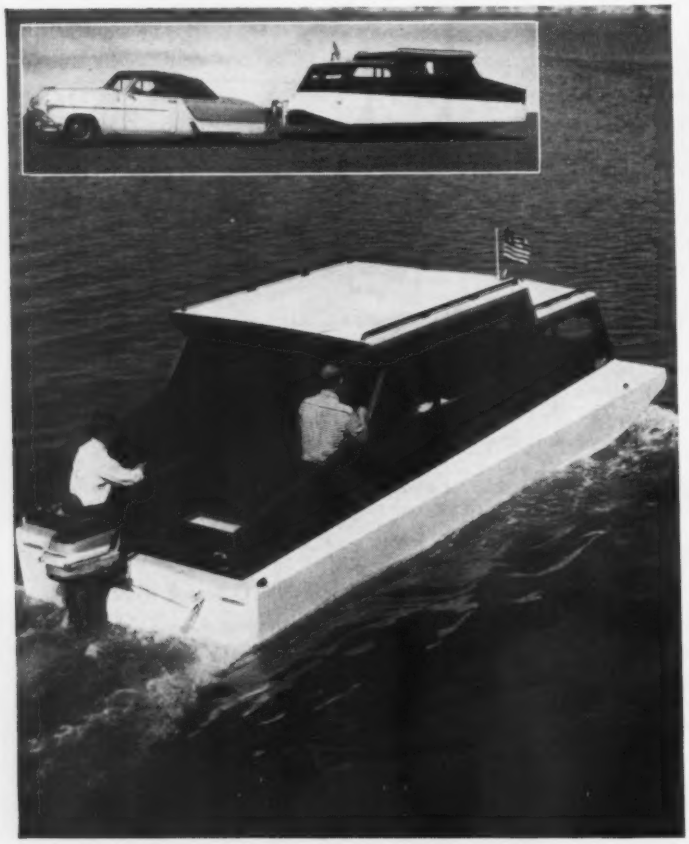
Founded in 1916, Oregon Portland Cement has an estimated annual payroll of $1,650,000 and 375 employees.

Norgren buys Stemac die casting firm

Purchase of the Denver die casting firm of Stemac, Inc., by the C. A. Norgren Co., Englewood, Colo., has been announced as effective January 1, with the purchased firm's name changed to Norgren-Stemac, Inc. Norgren, pneumatic products manufacturer, plans no changes in the personnel of Stemac, which employs about 60 workers. The new concern will have *Everett McKanna* and *Earl Stevens*, founders of Stemac, as operating vice presidents. New plans includ broadening the lines of die cast items produced and special emphasis on expansion of industrial die casting business. Norgren uses die castings in making products such as air line filters, pressure regulators and air line lubricators.

Beckman instruments gets new plant in Anaheim

Recently leased by Beckman Instruments, Inc., scientific instruments division, is a new 20,000 sq. ft. plant in Anaheim, Calif., where a data and control systems group will be located at 325 North Muller Ave. Urgent space needs and a growing backlog of orders necessitated the move, according to *John F. Bishop*, general manager. About 100 employees in sales, development and production units will transfer to Anaheim from Beckman's Fullerton, Calif., headquarters. Current projects of the company include a high-speed data and control system for Westinghouse; a monitoring and control system for Phillips Petroleum, and development of a special computer



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system for the Air Force intercontinental ballistics missile Denver test center.

Tidewater Oil to build two units at refinery

Further expansion for Tidewater Oil Co., calls for construction of two major units at its Avon, Calif., refinery, that will increase by 15% Tidewater's gasoline-making capacity in the West. The new units are a platinum catalytic reformer with an initial daily 22,500-bbl. capacity expandable to 45,000 bbl., and a steam-generating plant designed to burn coke which will be produced at the refinery's giant fluid coking plant completed last year as Tidewater's first expansion project. Also scheduled are a water treatment plant and storage facilities for an additional 188,000 bbl.

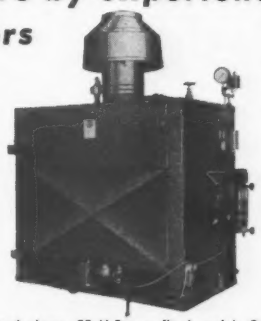
New PIE communications system to double capacity

Doubled capacity for its communications is expected by Pacific Intermountain Express when its new Western Union system goes into effect soon. Comprising about 7,000 airline miles of circuits, the system's switching center will be at Salt Lake City, with long line circuits to radiate in six directions following PIE's route pattern. Duplex and single line circuits with Western Union transmitters will provide service to 37 stations plus connections to Chicago for Spector Freight Lines, one of PIE's principal carrier interlines in the East. In the new system, relay or switch-back operations will be eliminated by having all "on line" traffic handled directly between stations, avoiding the relay center. Los Angeles, Oakland, Portland and Seattle will have dual circuits with two communication routes available to any other city on the system.

Summers Gyroscope starts So. Calif. addition

An addition that will more than double present facilities of Summers Gyroscope Co., was begun recently in Santa Monica, Calif., with a completion date set for July 1. The 103,000-sq. ft. plant and general office is adjacent to Summers' present plant. Sales for 1957 are expected to be in excess of $13,000,000, according to *Thomas O. Summers,* president of the company which produces guidance instruments and systems for piloted aircraft, guided missiles, target drones and other flight vehicles.

10 REASONS WHY
PARKER Industrial BOILERS
are preferred everywhere by experienced industrial plant engineers



Illustrated above, 22 H.P. gas fired model. Other sizes 1½ H.P. through 125 H.P. Also available for oil firing.

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3 LOWER FUEL COST—Many industrial plants have seen their fuel bill reduced up to 50% after replacing their present boiler with a modern Parker Boiler. This is fully accountable to a combination of the rapid steam generation and inherent operating efficiency built into every Parker Boiler.

4 SAFETY—Parker Boilers have never been known to internally explode nor has it been possible to induce such an explosion under most severe tests.

5 WATER TUBE DESIGN—This design has proven superior in every large modern boiler installation throughout the world.

6 EXTRA HEAVY CONSTRUCTION—Every Parker Boiler from the smallest to the largest is manufactured to exacting standards far exceeding any code requirement. You may fully expect more years of low cost service from a Parker than from any other boiler by following the simple operating and maintenance instructions included with every boiler.

7 FULLY AUTOMATIC—The finest controls, internationally sold and serviced, govern all phases of operation automatically with maximum safety.

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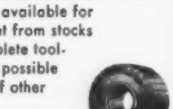

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Reynolds Metals Co. buys site at Torrance

Production of primary aluminum products is planned by Reynolds Metals Co. at Torrance, Calif., where the firm has purchased former shops of the Pacific Electric Railways Co. Over $1,000,000 is expected to be spent for conversion of the shops for factory use. About 1,000 persons will be employed at the new plant, which will be in operation in six to nine months.

Multimillion dollar Shell refinery unit scheduled

Shell Oil Co. has announced plans for early construction of a multimillion dollar platforming unit to expand production of high octane gasoline at its Wilmington-Dominguez refinery. Known as a platformer, the new refinery unit will use a platform catalyst and will increase the octane number of more than 500,000 gallons per day of gasoline components used for blending into premium gasoline fuel. The unit is of two sections, one for desulfurizing and the second for increasing the octane number of the gasoline stocks by the platinum catalyst.

Guardian Paper plans plastic-coating plant

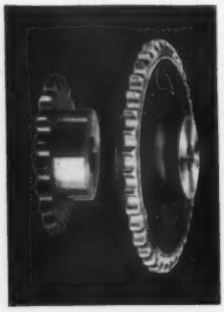
A $200,000 plant for production of plastic-coated bag and carton linings will be built in Newark, Calif., by Guardian Paper Co. of Emeryville, Calif. Construction will begin next year on property bought from the Southern Pacific Co.

Montana box factory plans spring operation

Operation of the Plum Creek Lumber Co. box factory is scheduled for next spring at Columbia Falls, Mont. The 92 x 112-ft. building factory was completed in December. Much of the raw material for use in the box plant is material formerly burned as scrap. Additional equipment planned for the plant are a planer, rippers, cutoff saws and nailers.

Modern Power Sweeper names distributor

The Hockwald Chemical Co. has been named Northern California distributor for products of Modern Power Sweeper Co. of Azusa, Calif. Located at 135 Mississippi St., San Francisco, the Hockwald company distributes maintenance equipment and will han-



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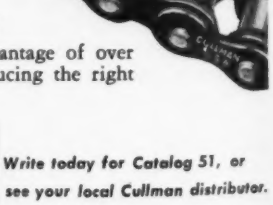

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dle the Azusa company's complete line including newly-introduced models MHD-36 and MHD-48 sweepers.

Levinthal completes research facility

Levinthal Electronic Products, Inc., now has all operations under way in its new Stanford Industrial Park plant, first in a planned development of several buildings. Open house ceremonies recently marked completion of the 12,000-sq. ft. facility where space will be devoted to research, development and manufacture of microwave, radar and communication systems, medical electronic equipment and scintillation crystals.

Dwyer Lumber plans Oregon plywood plant

A plywood plant adjacent to its new green veneer mill planned by Dwyer Lumber Co. of Portland, calls for 60,000 ft. of floor space and a monthly capacity of 3,000,000 sq. ft. of plywood. Scheduled as a long-range project, the plant when operational will employ about 175 more workers.

Griffith Rubber buys subsidiary, expands plant

Expansion of Griffith Rubber Mills in Portland includes acquisition of 16,000 ft. of additional floor space, and purchase of the Chemical Proof Corp. The purchased Seattle chemical firm will continue to operate as a Griffith subsidiary.

$100,000 plant scheduled by Oregon Saw Chain Co.

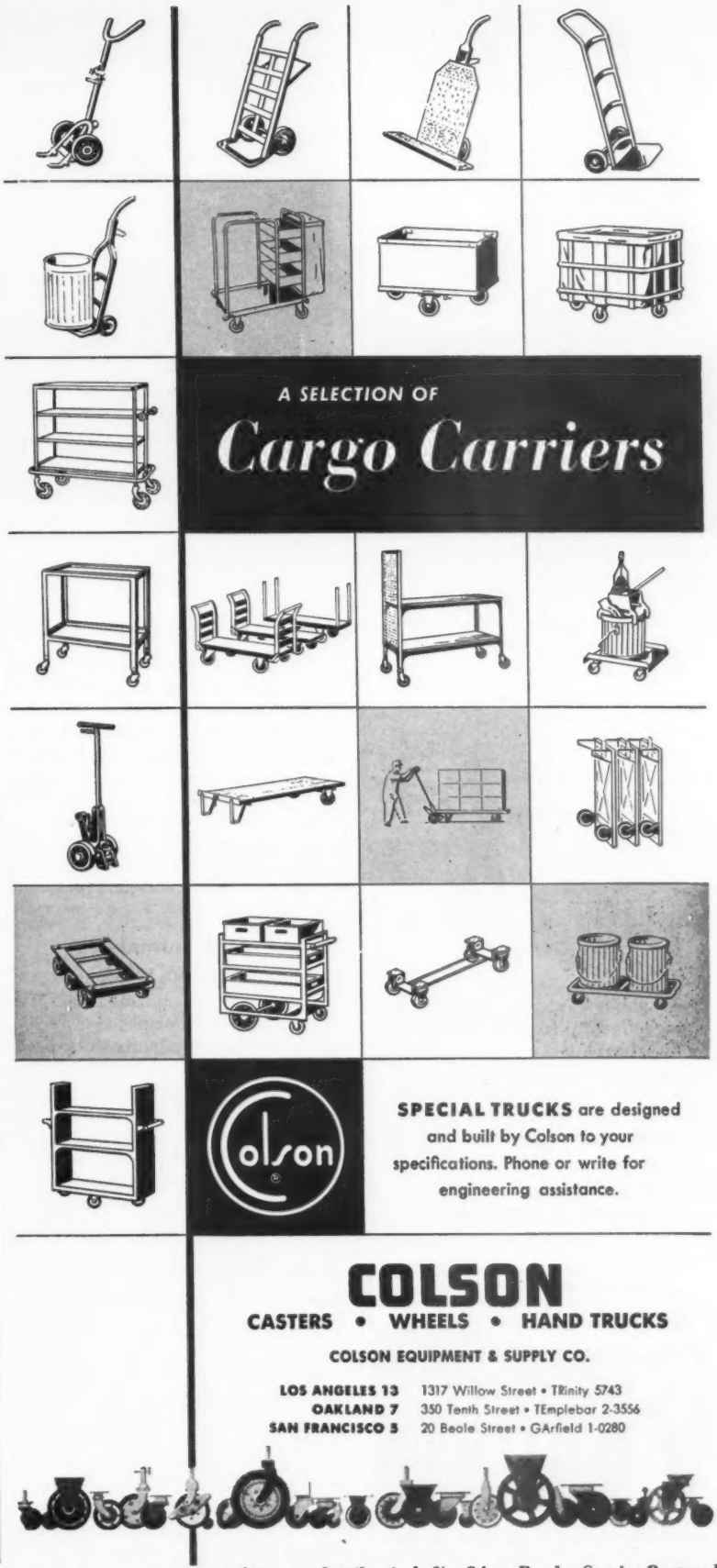
A new building, covering 20,000 sq. ft. and costing about $100,000, will be built by Oregon Saw Chain Co.'s precision cast parts division. Located on S. E. Harvey Drive, the new plant is adjacent to the firm's present site. The powder power tool division will occupy the vacated space.

Automatic Molding moves to new location

Now located at 3201 Exposition Place, Los Angeles, is the Automatic Molding Machine Co., maker of fully automatic high-speed compression molding machines. The new plant, a 20,000-sq. ft. brick building, is near Los Angeles International Airport.

Shades, Inc., will move plant to Sausalito

Shades, Inc., maker of split wood decorative fabrics, will move its plant from San Francisco to nearby Sausalito, Calif., where a new frame and stucco building of 4,800 sq. ft. will be built on a two-acre site.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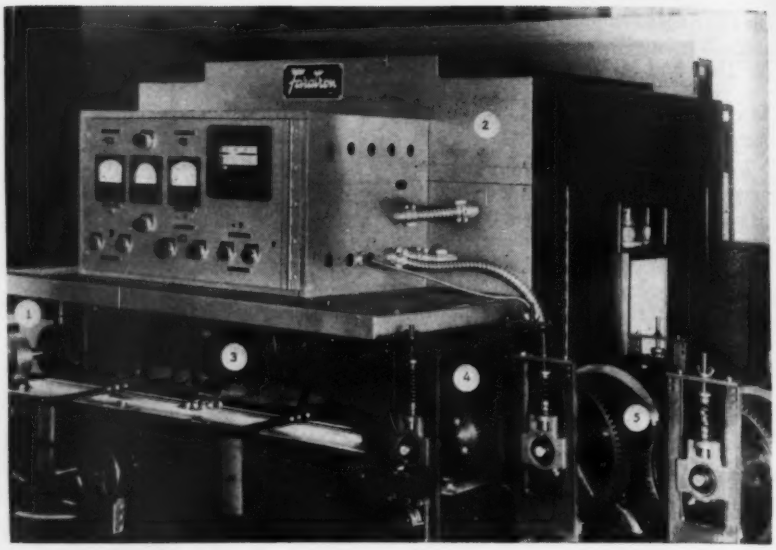

COMPLETELY AUTOMATIC, this high-frequency forming machine was built by newly formed Los Angeles firm, Faratron, for Douglas Aircraft Corp. to roll form Formica angles from flat strips. Components shown are (1) feed-in roller, (2) generator and controls, (3) electrodes, (4) feed-out roller, and (5) form rollers.

New firm produces dielectric industrial equipment

A new California company, incorporated within the last year, is Faratron formed for the purpose of designing and manufacturing industrial heating and forming equipment with emphasis on dielectric (high-frequency) equipment for the plastics, woodworking, foundry and aircraft industries.

Located at 4447 Union Pacific Avenue in Los Angeles, the firm is headed by Frans Vandenbergh, president-treasurer, and Mark D. Preston, vice president. Jay Gould III serves with them on the board of directors.

Faratron products for various industries are: plastics—re-heating, post-forming and heat-sealing equipment; rubber—curing-drying; woodworking — laminating, edgebonding, forming; foundries—core-ovens, and aircraft—laminates and sandwich-structures.

Wayne Mfg. completes new production wing

Wayne Manufacturing Co., Pomona, Calif., has completed a 30,000-sq. ft. addition for increased production and office space, bringing its total working area to 140,000 sq. ft. The new wing will handle final assembly of the firm's line of municipal and industrial power sweepers and Autoette Electric cars and trucks. Wayne's production line is expected to increase efficiency 25% by the new addition.

Thaler Pipe & Supply named plastic lines distributor

Thaler Pipe & Supply Co., of Oakland and San Jose, Calif., has been named distributor for National Tube Co.'s plastic pipe, and the complete line of pipe fittings and valves of Tube Turns Plastics, Inc. All are polyvinyl chloride (PVC) products suitable for wide industrial use. Thaler also stocks both standard and extra heavy normal impact unplasticized pipe valves and fittings up to 4-in. diameter.

Perry Kilsby opens San Francisco office

A new sales office at 760 Market St., San Francisco, has been opened by Perry Kilsby, Inc., distributor of stainless and aluminum tubing, carbon and alloy mechanical and aircraft steel tubing, and the line of extruded aluminum Holobar and Polyvinyl Chloride plastic pipe, valves and fittings. T. S. (Tim) Peachee, will be in charge of the San Francisco office.

Air Reduction Pacific expands Seattle plant

Additional new facilities for the Seattle air separation plant of the Air Reduction Pacific Co. will triple the plant's capacities and permit production of liquid, as well as gaseous, oxygen and nitrogen. Gaseous argon will also be produced when the addition is completed by the end of April. Air Reduction Pacific is a division of Air Reduction Company, Inc. L. A. Hamilton, vice president, is head of the new Seattle district.

WESTERNERS AT WORK . . .

American Latex Products Corp.

H. B. Gartner

. . . has named *Harold B. Gartner* its vice president in charge of production. One of the firm's original employees, he began in 1939 as a foam rubber fabricator. In his new position he will direct manufacture and fabrication of foam rubber, plastics, and adhesives, as well as maintenance and engineering departments. Gartner also will be in charge of the corporation's current $10,000,000 expansion program.

E. W. Bliss Co.

. . . has added two sales engineers to its San Jose Division. They are *Harry A. Skillman* and *Samuel C. Longo*, and both will be in the Bliss Southern California sales office in Burbank. Skillman has many years of tool and die, and machine tool sales experience. Longo previously worked for Reliable Steel Supply and Utility Fan Corp.

Bay State Abrasive Products Co.

. . . has named *John R. Anderson* of South Colby, Wash., an abrasive engineer to cover Washington, northern Oregon and Idaho. Anderson was previously with the procurement department of Puget Sound Naval Shipyard.

Joseph T. Ryerson & Son, Inc.

L. W. Werthman

. . . has appointed *Louis W. Werthman* sales manager for its San Francisco Bay area plant at Emeryville, Calif. Joining the Ryerson firm at Chicago in 1940, Werthman has been with the West Coast district since 1947, recently as manager of the inside sales department.

Jeffrey Mfg. Co.

. . . has announced appointment of *Carl G. Schilbe* as district manager of the Salt Lake City territory. A sales trainee with Jeffrey in 1953, Schilbe has worked in the erection department, in quality control, and various other sections as an engineer. In charge of sales for both industrial and mining division products, he will have offices at 211-212 Utah Oil Bldg., 10 West Broadway, Salt Lake City.

American Steel & Wire Div., U. S. Steel

. . . has appointed *A. J. McCutcheon* as area sales manager for its cyclone fence department, with headquarters at 954 60th St., Oakland. Beginning his career with cyclone fence division in 1924, he has been in sales positions in Oakland, Seattle and Portland.

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Worthington Corp.

E. W. Hammond

. . . has appointed *E. Weston Hammond* as Los Angeles district manager, replacing *J. G. Murphy*, who has been appointed special representative. Hammand has been with Worthington since 1922 and has been assistant district manager since 1951. Murphy, Los Angeles district manager since 1930, joined the firm 10 years before that, serving both in Seattle and El Paso.

Kenworth Motor Truck Co.

. . . has named *Lewis T. Gerlach* general sales manager, succeeding *R. D. O'Brien*, now general manager of the Seattle firm. A Kenworth employee for nearly 21 years, Gerlach has worked primarily in sales engineering since World War II, including special assignments in Canada and Washington, D. C.

Fairbanks, Morse & Co.

. . . has transferred *W. P. McAnally* to Pomona, Calif., to manage the company's works there. Formerly manager in Stuttgart, Ark., McAnally replaces *P. R. Flood*, now general manager in Beloit, Wis.

Beam Products Mfg. Co.

. . . has announced appointment of *Woodrow "Woody" Burgess* as Northwest factory representative for LP-gas carburetion.

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Allis-Chalmers Industries Group

. . . has new titles for three Los Angeles men and two in San Francisco. In the Southern area they are *T. R. Bluemle*, manager of industrial sales; *A. W. Leighton*, manager of utility sales, and *D. E. Steel*, manager of petroleum and chemical sales. All three have been with Allis-Chalmers in Los Angeles for some time, Leighton being transferred there in 1953 after serving in Kansas City and Cleveland areas. In San Francisco *G. K. Lewis* has been appointed manager of utility sales for that district, and *Alan Purchase*, manager of industrial sales. Lewis has been with the company's San Francisco district since 1948, and Purchase since 1949.

Bethlehem Pacific Coast Steel Corp.

J. G. White

. . . has named *John G. White* district manager of sales succeeding *Harold E. Gray*, who retired recently. Assistant manager of the corporation's Seattle sales district since 1952, White will be in charge of all Bethlehem Steel and Bethlehem Pacific products in Washington, Northern Idaho, Western Montana and Alaska.

Drake Steel Supply Co.

. . . has appointed *Dempsey Huff* as sales manager of the Los Angeles headquarters plant. Huff has been with the Drake company in a sales capacity since February 1953.

Raybestos-Manhattan, Inc.

. . . in its Manhattan Rubber Division, has reorganized its sales structure, with *S. V. V. Hoffman* as one of four regional managers. Hoffman heads the Western region, with *R. B. Park* as San Francisco manager, supervising field salesmen's activities.

Industrial Gear Mfg. Co.

. . . in line with its expanding sales campaign, has appointed *J. A. "Tony" Schaefer* its West Coast sales representative. Headquartering in San Mateo, Calif., Schaefer will also maintain offices in Los Angeles, and will represent Wisconsin Centrifugal Foundry Co. and Dahlstrom Machine Works as well as Industrial Gear. He was previously executive vice president of Dries & Krump Mfg. Co., Chicago.

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Chain Belt Co.

H. F. Bergis

. . . has two Portland, Ore., promotions in its list of recent personnel changes. *H. F. Bergis*, formerly district sales manager at Portland, becomes Northwestern regional sales manager, while *Wilbur F. Church*, formerly sales engineer, steps up to district sales manager.

Sierra Drawn Steel Corp.

. . . has named *Elven R. Davis* vice president in charge of Northwest operations, with headquarters at 6600 Airport Way, Seattle. He succeeds *James Allison* who died in December. A member of the firm's staff since 1953, Davis was formerly purchasing agent at Los Angeles.

Modern Power Sweeper Co.

M. E. Runner

. . . has announced appointment of *Melvin E. Runner* as sales manager. Formerly with Dayton Rubber Co., for 17 years during which he was a national sales manager, Runner also worked for Babcock Motors Co. and Studebaker-Packard Corp. before joining the power sweeper firm.

Solar Aircraft Company

. . . has named *Donald M. McGrath* manager of its San Diego plant. Formerly with Bendix Aviation, he managed its Utica division and also the Red Bank division.

Consolidated Western Steel Div., U. S. Steel

C. T. Osborne

. . . has announced appointment of *C. T. Osborne* as manager of its Fresno plant, succeeding *John W. Hall*, who retired recently after 47 years service. Assistant manager at Fresno since 1948, Osborne began with the former Western Pipe and Steel Co., in 1942 at San Pedro, Cailf.

General Dynamics' Convair Division

. . . has realigned all manufacturing research and development activities under a centralized head, with *F. A. Monahan* named manager of manufacturing development and process specifications. Formerly coordinator of research and development at Convair-San Diego, Monahan joined Convair in 1951 as a guided missile design specialist at Pomona, and the following year was made assistant vice president of manufacturing in San Diego.

Columbia-Geneva Steel Div. of U. S. Steel

. . . has personnel news regarding *J. D. McCall, H. B. Montross, Jr., William T. Ayers, William M. Montgomery*, and *Robert J. Prout*. McCall, named vice president for operations, has been with the organization snice 1936, when he was employed as an engineer and statistician at Pittsburg, and has served in varied capacities since then. The promotion of Montross to manager of heavy products sales follows nearly 10 years with U. S. Steel. He will continue to have headquarters in San Francisco where he succeeds *John E. Mattos*, recently transferred to the Southern sales district. Ayers, with Columbia-Geneva since 1946, was named superintendent of engineering and maintenance at Torrance, Calif., where Montgomery, formerly superintendent of open hearth, has been named superintendent of rolling mill. Prout steps up from assistant superintendent to superintendent of open hearth at Torrance.

Arcadia Metal Products

. . . has promoted *Wlliam R. Mason* to the post of chief engineer, after a year's service as production engineer. Formerly on the University of Washington faculty, he also was divisional director with the Port Hueneme U. S. Naval research laboratory.

North American Aviation, Inc.

W. E. Fore

. . . has promoted *W. E. Fore* to plant engineer at its Los Angeles division. Starting with the firm 19 years ago, Fore, a chemical engineer, has held a variety of responsible positions and was organizer of North America's conservation department.

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are ⅛ inch short of contracted space to allow for borders and composition. Rates are $9.00 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

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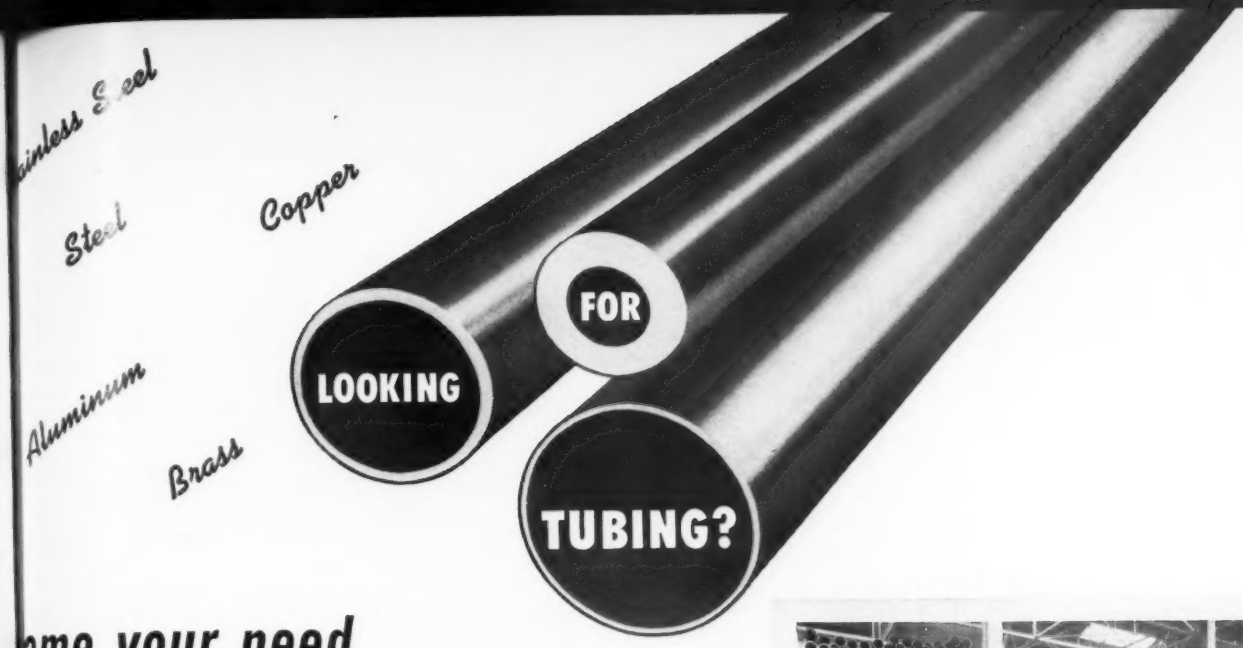

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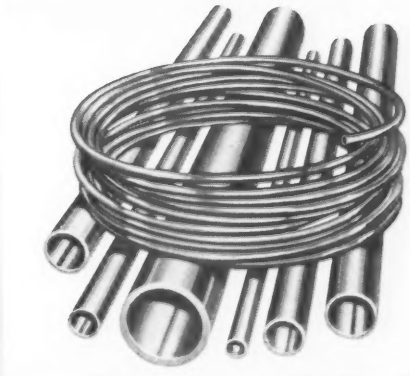

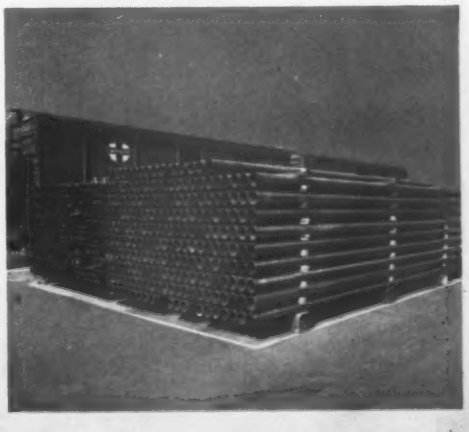

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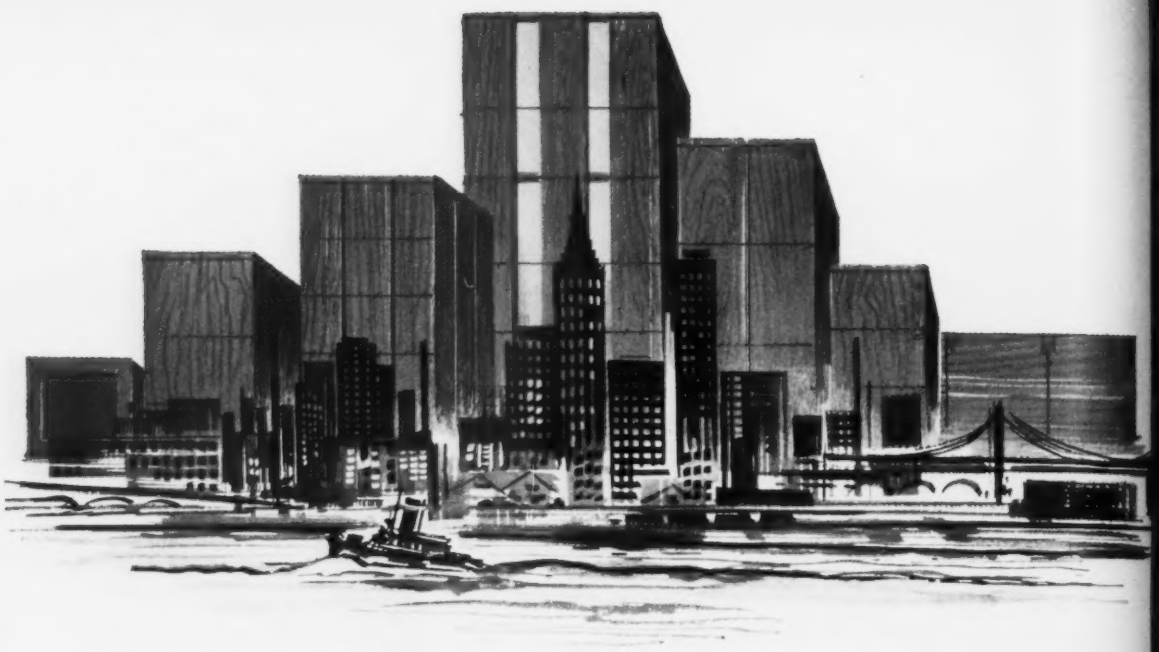

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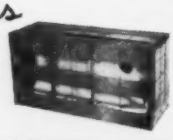

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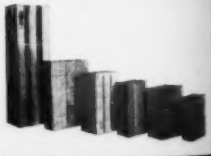

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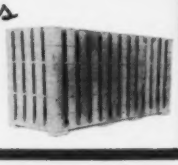

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